COMPLETE INSPECTIO

BODY AND UPPER CHASSIS

- 1—Inspect top for leaks, discoloration, bow paddings, and broken back curtain glass.
- 2—If an enclosed car
 - Inspect window elevating devices, sash, and interior fittings.
- 3—Inspect side curtains, for broken windows, and curtain fasteners.
- 4—Inspect under seat cushions and see that starting crank is present
 - a-Hand tire pump is in working condition
 - b-Jack is in working condition
 - c-Tool kit is complete
 - d-Top boot or cover is in good shape.
- 5—Inspect body and see that doors close properly a—Curtain fasteners are provided at necessary
- points b—Windshield opens and closes and is securely
 - anchored c—A fire extinguisher is provided
 - d—The clock is in running order
 - e—All instruments and their mountings for loose nuts or wire connections.
- 6—Inspect spare tires and rims for punctures, and distortion.
- 7—Inspect speedometer head and drive mechanism.
- 8—Inspect headlamps (for broken lenses).
- 9—Inspect front fender anchorages.
- 10—Inspect radiator for leaks, and flush with jet of water. See that anchorage is O. K.
- 11—Remove, inspect, lubricate, and adjust front wheels.
- 12—Inspect all steering connections including
 Spindle body bolts for looseness and lubrication
 Spindle steering arm bolts for looseness and lubrication
 - Drag link ball joints for looseness and lubrication Steering column for backlash, stiffness, up and down play, and lubrication.
- 13—Inspect spring clips or "U" bolts.
- 14—Inspect spring shackle bolts for looseness and lubrication.
- THE ENGINE COMPARTMENT IS NEXT IN ORDER
- 15—Inspect hood and sill fittings and fasteners.
- 16—Inspect hose connections and hose clamps.

- 17—Inspect fan for tightness of belt and lubrication fan bearing.
- 18—Inspect water pump packing glands.
- 19-Inspect and clean vacuum tank gas inlet straine
- 20-Inspect and clean carbureter gasoline strainer.
- 21—Drain all oil from crankcase to see if oil gauge in cates "danger" or "empty."
- 22—Inspect and clean distributer and interrup mechanism.
- 23-Inspect and clean spark plugs.

START THE ENGINE SEE THAT

- 24—Choker control is operative.
 - a-Engine hits evenly on all cylinders
 - b-Tappets are properly adjusted
 - c—Generator commutator is clean and bearing
 - d—Spark and gas throttles give full open and cl
 - e—Oil pressure gauge registers proper amount
 - f—Ammeter shows charge at speed above 8
 - g—Engine does not knock when load is applied engaging clutch slightly with high gear engag and emergency set.
 - h—Inspect for all mechanical noises.

STOP ENGINE

- 25—TEST COMPRESSION WHILE WARM.
- 26—Remove floor boards from driver's compartment and inspect rear of instrument board for locuries, pipes, or nuts.
- 27—Inspect clutch throwout linkage.
- 28—Inspect, wash and lubricate clutch.
- 29—Check valve and ignition timing from flywh marks.
- 30-Inspect slip joint between clutch and transmission
- 31—Remove transmission cover and inspect for loc main or countershaft bearings.
 - a-Condition of gear teeth
 - b-Lubrication.
- 32—Inspect emergency brake lever pawl.
- 33—Inspect from universal joint.
- 34—Inspect all cross shafts and fittings anchored w bolts.

ECTION CHART

of belt and lubrication of

g glands.

tank gas inlet strainer.

ter gasoline strainer.

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NE SEE THAT

all cylinders djusted

r is clean and bearings

give full open and clos-

isters proper amount re at speed above 800

when load is applied by with high gear engaged

cal noises.

LINE

HILE WARM.

n driver's compartment rument board for loose

kage.

e clutch.

timing from flywheel

clutch and transmission. er and inspect for loose arings.

ever pawl.

fittings anchored with

REPLACE FLOOR BOARDS

- 35—Inspect clutch and brake pedals to see that they do not interfere with floor boards.
- 36—Turn on all light switches and note whether all lamps are lighted.
- 37—Inspect battery for gravity, water, ground connection.

INSPECT UNDERPART OF CHASSIS (use the sliding cot)

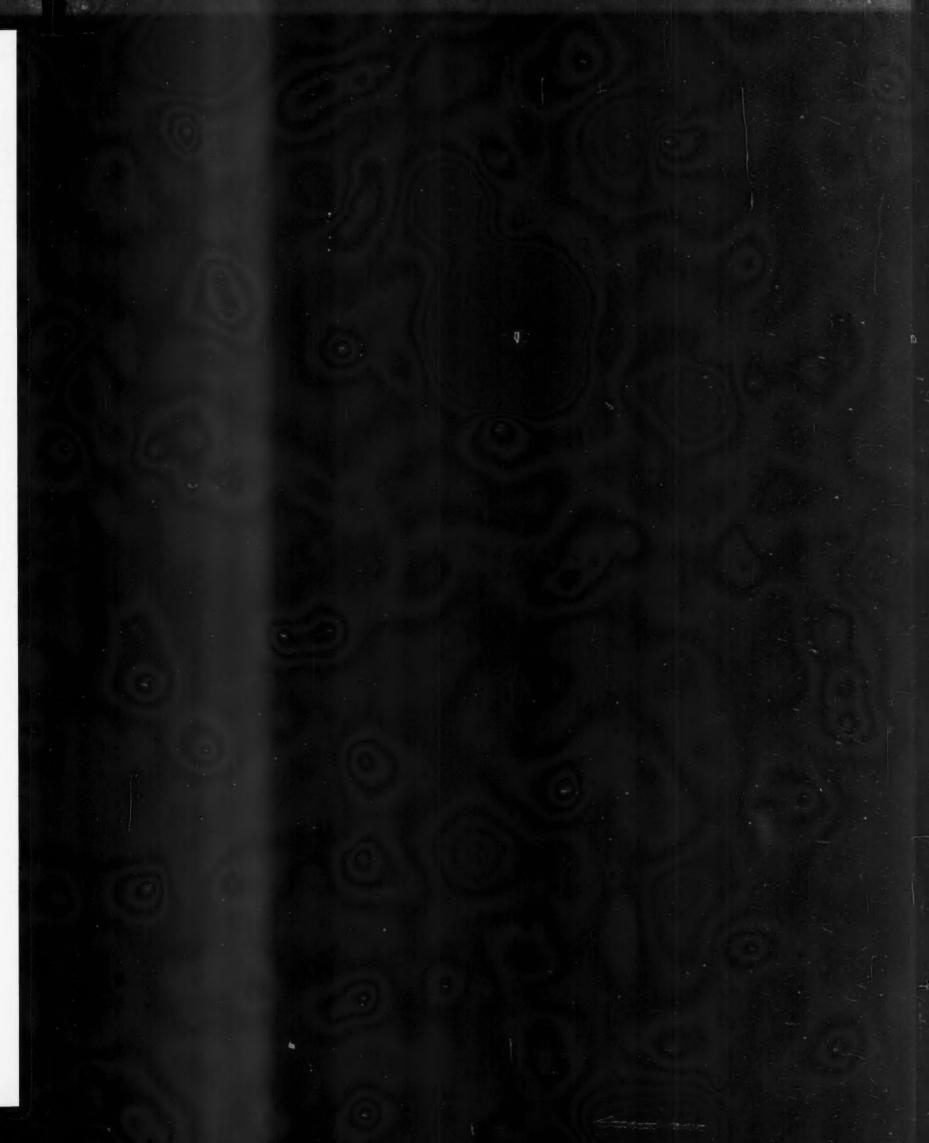
- 38—Inspect electrical wiring where it is not in conduits.
- 39—Inspect drive shaft assembly for loose fabric disk bolts or loose covers on metallic joints.

a-Inspect drive shaft for backlash.

- b-Adjustment of pinion shaft outer bearing.
- 40—Inspect torque arm for broken spring, or worn hinge bolt and bushing.
- 41—Inspect brake linkage for lubrication, clevis and cotter pins.
- 42-Inspect brake lining.
- 43—Inspect rear spring shackle bolts for looseness and lubrication and spring leaves for lubrication.
- 44—Inspect gas line and see that it does not rest on any portion of the car that would cause chafing or breakage.
- 45—Inspect body anchorage bolts.

REMOVE DIFFERENTIAL COVER PLATE AND DRAIN LUBRICANT

- 46—Inspect differential assembly for worn or chipped gears
 - a—Condition of carrier bearings
 - b—Adjustment of pinion shaft
 - c—Grease retaining devices.
- 47—Inspect rear wheels for tightness.
- 48—Gasoline tank for leaks if located at rear.
- 49—Inspect rear spare tire carrier.
- 50—Test the car on the road to see that service and emergency brakes are correctly adjusted, that engine has full power and gears shift easily, and that steering gear operates smoothly.





Runwell Auto Service Co.

Service Inspection Report

Owner's name	************************
Address	
Date	regularization de des regulações
Make and model of car	******************
1—Inspect tires to see that they are inflated	CONDITION
3—Inspect front hub caps for tightness	
6—Inspect all parts or fittings at the front end of the car that are held on by bolts or serews	
7—Take a look at the sod pan to see that it is securely anchored Raise the Hood	**************
8—Inspect all hose connections	
9—Inspect fan for tightness of belt and lubrication of fan bearing 10—Inspect water pump packing nut for leaks (tighten if loose) 11—Open drain on vacuum tank and allow sediment to drain off	******************
12—Open drain on carbureter and allow sediment to drain off	***************************************
screws in engine compartment (including hood and sill fittings and engine anchor bolts)	************
Lower the Hood	
14—Inspect battery for water and ground connection	
16—Inspect back of instrument board (see that all wires and nuts are tight)	*************************
17—Inspect foot pedals for interference with floor boards	
19—Pull on the emergency brake lever to see that linkage is not disconnected	
Get Under the Car	
20—Inspect the drive shaft assembly for loose fabric disc bolts or loose covers on metallic joints	***************************************
21—Inspect torque arm for broken spring	
23—Trace gasoline from tank and see that tubing does not rest on any portion of the car that would cause chafing or breakage	
24—Inspect gas tank and its anchorage	
26—Inspect all parts at the rear of the car that are anchored by bolts or screws	
Signed: RUNWELL AUTO SE	RVICE CO.
Ву	Inspector
Are there any other matters requiring attention not already cove	red on above

Shop copy of "enroute" inspection chart. It is made in duplicate, the owner retaining one copy

or even some workmen, can visualize or think of all the items that must be inspected. If the merchant can show the owner a tangible and arranged list, he cannot deny their existence and can be more easily impressed with the desirability of a complete inspection.

The large inspection chart lists practically everything that should be inspected on any car. Used as a working guide, it enables the workman to proceed in an inspection with some semblance of system. It is difficult to remember fifty distinct operations or points of inspec-

tion, but with the chart it is not necessary to depend on man's memory. The items are so listed that unnecessary steps will be avoided when working on a car of average construction. Additions in the way of merchandising appeal may be printed on the same sheet or it can be gotten up in folder form, with suitable printed advertising data added.

Complete Inspection Can Be Sold for \$5

The time required to do a complete inspection will of course show an appre-

ciable variation, but it can be done within the three-hour limit. The price is to be charged for the service can be determined in much the same manner as setting a flat rate for an operation and with less uncertainty. Assuming the average hourly rate to workmen, the job can be flat rated to sell for \$5. It should provide a decent profit at this price and it will invariably lead to the sale of repair work or accessories. When the tool compartment under the seat is inspected is the time to remind the owner of the necessity of having at least one good jack, some spare tubes and a good hand pump.

The En Route Inspection Chart

The "en route" inspection chart is compiled especially for the use of the station located away from the home port of the tourist. The shop form is used in duplicate, the customer retaining one copy, which records the condition of the parts inspected. Whether he does or does not have any repair work done, he is advised to retain the copy, which he will use to advantage when ordering repairs to be made.

When used as an advertising medium, the "en route" inspection chart can be arranged something like the one shown. For either purpose the points of inspection are included.

Local conditions will have to be considered in laying out any plan of procedure on this service. Factors that enter

into the working of the system are:
Time of arrival of the tourist's car
Night personnel
Hotel accommodations.

The time of arrival of the tourist's car is important, especially in the smaller towns and in the small establishment. It may be that there is no night mechanic and if the car is brought in after working hours it must wait until morning before it is inspected. The tourist is usually in somewhat of a hurry to be on his way and does not care to be detained in the morning while the car is being inspected. In localities on heavily traveled highways it would be advisable to have a night man who is also a good mechanic.

If possible, the inspection should be done at night, because it allows of informing the owner of the car's condition before morning, and also because there is less to interfere with the work of the man doing the job.

In conjunction with this it might be mentioned that it is not necessary to run the car back on the shop floor. The inspection can be given to the car as it stands, there being required only enough space between adjacent cars to permit of elbow room.

If the hotel rooms have individual phones it is advisable to inform the owner of the result of your inspection, as he may then authorize the maintenance work necessary to correct what the inspection has divulged. However, the aim should be to secure the authorization before completion of the inspection, which would eliminate the incon-

(Concluded on page 20

Selling Tourists Maintenance and Repairs by the Job

Tourists Should Be Told Price of Job On the Spot. Getting Up a List of Group Operations with Definite Price for Each Big Help in Selling the Work. Desirable to Sell Inspection System to Customer

By B. M. IKERT

S of far as possible a tourist who brings in his car for adjustments or repairs, or leaves it over night for storage, inspection and repairs, should be told before he leaves for the hotel what the various charges to him are going to amount to.

BETROITMEN

The tourist, above all, is not one to be gouged on the uncalled-for grounds that the chances are ten to one you never will have him in your shop again. Maybe he is coming back over the same road later on and he will remember the places where he received good and bad treatment. He will remember the dealers' shops and service departments which are run on a business-like basis. He will shun the uninviting place where some uncouth mechanic just made a bum guess at the cost of a job and incidentally guessed plenty high.

Right now, before the great caravans of tourists have started their cross country trips is the time for every dealer, especially those located on the important and much traveled highways of the country, to look around his place of business and see whether or not he is all set for the business that is his, if he goes after it right.

He may have quite a good sized shop and service station; he may have ample equipment and good mechanics, but he is not up to the minute if he has a poor system of selling his maintenance to the tourist customer.

Several things must be borne in mind when considering the selling of maintenance to the tourist. In the first place a tourist usually does not want to be tied up in a town any longer than necessary. Then, too, he may want to do some shopping in the town while the car is being repaired, but while doing this he prefers to have some idea of what the job at "the garage" is going to cost him. You cannot reach him on the telephone as you might a regular customer located in your vicinity. Things have to be done on the spot and every provision must be made to transact the business quickly and accurately.

As a rule a tourist who comes in to a service station knows pretty well what he wants, unless there is something which he is in doubt about, as the electrical system, for instance. But a tour-

ist whose car has a broken front spring, or one in which the starting motor will not turn over the engine, is pretty nearly sure to have an idea as to what is needed to effect a remedy.

On the other hand, there are a lot of tourists who assume that their cars are all right when they put them in a garage over night. As long as the car seems to run all right, they take for granted that everything is ship-shape. But what of the rim lugs that might have loosened up on a day's drive of 200 or 300 miles over rough going? What is there to say that the front wheel bearings do not need tightening? Or, again, there may be a broken torque arm buffer spring. The springs may need lubricant and perhaps the shackle bolts are as dry as a piece of toast. Anyhow, the tourist ought to know these things and who is there in better position to inform him of them than those employed in the service station or garage where he leaves the car overnight or into which he drives in for some minor repair or adjustment?

In the article entitled "Profitable Inspection Service for Tourists," in this issue, we show the possibilities of selling the customer on an inspection of his car when he leaves it overnight. The

inspection is the first requisite, of course, and only on the strength of it can the customer be sold intelligently the adjustment and repair groups listed on these pages, in connection with this article.

We call attention to the six groups of operations which we have complied especially to fit the needs of the tourist. These operations might be printed on one sheet of paper and called "Special Tourist Service" or something similar. The operations, as will be noticed, are typical of those which come up every day in the small town service station or shop. It will be noted also that most of them do not require any tearing down of major units. Practically the only one which involves a tear-down is the valve grinding operation and as this is one of the most frequent performed, there should be no difficulty experienced in getting together the necessary tools and equipment to put the job on a flat price basis.

The prices quoted are average. They will be too high in some places and too low in others. That is something which every dealer or maintenance man must figure out to meet his local conditions. But, in the main, the prices will fit most

RUNWELL MOTOR CAR CO. Elywin, Neb.	COST
Furnish & Justall Right Front Spring	7.50
TOTAL	7.50

For those jobs not listed on the special tourist service sheet of operations an additional work card like this will be found useful

RUNWELL MOTOR CAR CO. Elywin, Neb. SPECIAL TOURIST SERVICE GROUP No. 1 Clean exterior of engine 1.50 Grind valves 7.75 Adjust valves .75 Clean carbon 1.00 Clean plugs .75 Adjust distributer points .50 Adjust carbureter .50 Adjust timing chain .75 Adjust fan belt .25 Install new hose connections .85 Repack water pump gland .75 Cost 15.35 GROUP No. 2 Lubricate spring leaves 2.00 Oil and grease chassis 1.50 Change engine oil 1.25 Cost 4.75 GROUP No. 3 Adjust steering gear 1.00 Adjust tie rod bolts .75 Line up front wheels 1.00 Adjust drag link .50 Adjust front wheel bearings .50 Cost 3.75 GROUP No. 4

Adjust clutch

Cost

GROUP No. 6

Adjust brakes

Cost

1.00

Cost

Total to Be Paid by Customer

1.00

I Ool

Cost

I Ool

GROUP No. 5

This is a suggestion for getting up a group list of operations which are frequently performed, especially on tourists' cars coming into the shop. There is a fixed price for each group and in addition there is a price for each operation in the various groups. This makes it easy to sell the various operations, as any combination can be quickly made up and the cost determined

of the popular makes of cars, especially those coming in the popular priced six-cylinder field. The thing to remember is to have some kind of a price listed after the operations. The customer must be sold on the same basis as a restaurant sells him a club breakfast. Let him

Tighten body bolts

Tighten spring clips

Tighten shackle bolts

Tighten rim lugs

Cost

Tighten spring saddles

Tighten hub caps

select the group of operations he thinks he wants. Nevertheless, the dealer's men must be on the job to point out to him any other group or item which inspection shows it is desirable to have done on the car at this time.

.75

75

1.00

.50

.25

3.50

It is possible, for example, to perform

Group 2 and 4 at the same time. Both involve pretty much the same parts. For example, while a mechanic is lubricating the car springs he can at the same time tighten the shackle bolts and lubricate them.

There are always jobs, of course, which come up from day to day and for which no provision has been made on the sheet of the flat rate groups. For instance, a man drives in with a leaky radiator, or a broken spotlight bracket. Maybė a gasoline tank strap is broken or he wants you to make a bracket to hold down one end of the storage battery, the original bracket having been lost. Naturally some provision must be made for this kind of work, because it always will come up, and many times is given as the reason that "you can't put this work on a flat price, because it's always different." We say it can be handled on a flat price, because it is being done now by many.

To get a little better idea of how the special tourist groups of operations suggested herewith can be sold, let us assume the following:

Suppose a tourist drives into your place of business and states that his engine does not operate properly. The mechanic finds that the valves need adjusting and that the distributor points are rough and pitted.

Perhaps the tourist has driven a long ways and has been on the road several days. The mechanic making the inspection on his car notices that the springs ought to be lubricated and that the clips are loose. So, he calls the attention of the customer to these facts and presently produces a copy of the Special Tourist Service flat rate operations.

He goes over the car with the owner and with pencil in hand puts down a check mark back of the operations decided upon. Thus we find under the engine group three operations, including the adjusting of the valves and distributer points and installing new hose connections.

We also find that group No. 2 has been checked to be sold complete. Two operations in No. 3 group and one in No. 4 are checked, while No. 6 group, that of adjusting the brakes, also has been checked.

Then, before the customer leaves, the cost of the various operations are added and the total in this case is \$10.10.

Now, suppose the customer wants another job done which is not listed in the various groups. Assume the job is that of furnishing and installing a right front spring. For this a printed card bearing the name of Additional Work Order might be gotten up and on which the various operations not listed on the Special Tourist Service sheet can be recorded. Thus in case of the right front spring, the card would be made out as shown in the illustration. This is then clipped or pinned to the other sheet and all the records pertaining to this particular order can be kept togetner.

This simplifies the record keeping and

regardless of how many tourists drive in and congest the place, there will be little need for the mechanics and other attendants to run around figuring up the bill of the customer, who might be impatient to be on his way. By letting him know before you start his work what the job costs, he is all prepared and may even pay you the night before, so he can drive his car away in the morning with nothing to bother about. As long as the customer knows that the job is \$10.10 regardless of when it is paid, he may be just as apt to pay it before the work is started as afterwards.

It would be well to make out the sheets in duplicate, because the customer can keep one copy and the shop can retain the other. The order should have the name of the car upon it and in addition the mechanic's time should be listed on the back. In this way there will accumulate a series of work orders which

will be fine background for planning next season's touring maintenance. It may result in having to boost the prices for some of the operations, while others may be reduced. It will be possible to figure averages. You get a check on the nature of the jobs done in your shop. It may show that you do a lot more valve work than you imagined, and to that end you may find it necessary to install equipment which will facilitate valve work.

In the past there have been too few maintenance shops in the smaller towns that have kept records. True, many of them have had some sort of book in which they have put down the money taken in during the day and the money which was paid out. That is all right so far as it goes, but such records do not offer a ready means for making deductions and analyzing future business. It is the lack of proper records that has

prevented many a small town dealer and maintenance man from putting his work on a flat rate basis. He has nothing to go by and, therefore, hides under the cloak of the old so-much-per-hour basis.

The special Tourist Service sheet suggested here offers something definite. The dealer must first see to it that the prices are right for his conditions. After that his local printer can make up the sheets for him. They need not be confined to the tourist alone. They can be mailed to car owners in the locality. Many of them will be planning tours and the time to do the work is before they go on such tours. The dealer or the man specializing in selling maintenance can put on a selling campaign for this kind of service and as long as the car owners know exactly what they will have to pay for the work they are much more apt to drive in than they would otherwise be.

23 Years Ago This Week In MOTOR AGE

(From Motor Age of April 5, 1900)

First Motocycle Store

BOSTON, Mass., April 1 (1900)—The Hub now has what it claims is the first motor tricycle store in the country. It was opened formally to the public last Wednesday by Kenneth A. Skinner at 268 Massachusetts avenue and a full line of the De Dion product, including a Voiturette, was inspected by a big throng of Bostonians. . . . Everyone who desired was given a free ride on the day of the opening and a large number of orders was booked.

Another Pioneer Store

Eddie McDuffee, the great bicycle pace follower, has arranged to open a store for the Locomobile Co. of America at Fifth avenue and Forty-second street, New York, and will be ready for business by April 5.

Dyke Started Supply House

The accompanying illustrations (not reproduced) show two styles of running gears for motor vehicles which are being supplied by the Automobile Supply Co. of St. Louis, on which prompt deliveries can be made. . . . Electric motors with storage batteries are furnished in 1½ to 4 horsepower. Steam boilers and engines, with all accessories thereto, are furnished in 4 to 6 horsepower ratings. Gasoline engines are furnished in 2, 3, 4, 6 and 8 horsepower. . . . A. L. Dyke is general manager of the company.

A Good Roads Dinner

NEW YORK, April 1 (1900)—Over sixty seats have already been taken for the dinner the Automobile Club of America is to give Gen Nelson A. Miles and his fellow members of the transcontinental highway commission at the Waldorf-Astoria on Monday evening.

Dan's Diary

APR. 5—Me remembering how last summer cars got all balled up out in front of our place gettin gas and oil but mostly free air and water and how titewads gettin free air in old leaky tires kept swell customers from gettin gas



My Boss

cuz the free air pikers was in the way so they went up to casey's and got ten gals., i said to the boss yestiday, "say boss how about that filling station, hadn't we better get that fixt up sos it will be ready for rush biznis nex summer?

I didn't know that

filling station was busted or leaked or anything and besides i aint paying you to run this here

place an when i do want you i will send you a telegram. Why aint you out there mending that gasoline pipe for Charley Lucas. Charley Lucases pipe is fixed and paid for and in the cash register 55c and the car gon i sais. Only 55c sais he, wy didn't you make it last longer and let him pay for it instead of loafing around here at my expense haf the afternoon, wich was a swell sentiment i don't think.

This morning the big cheeze comes around all excited and sais, Dan i wist you would go over to the plumers an get 3 or 4 lenths of hat inch pipe. I want to move that free air around to the side of the building so they won't drive away so many gas customers gettin' in the way of the pumps, You remember how bad it wuz las summer. All I sais is all right, but thinking to myself after me sugesting it to you las summer and you forgeting it and me telling you about it again yestiday now you comes in and thinks you done it all yourself. Gee, gosh, heck, Wots the use!

(Continued from page 17)

venience to the tourist of walking downstairs to answer from the solitary desk phone.

It might be argued that if the man is in a hurry he will not wait to have you do the maintenance work suggested as the result of your inspection. This will be true in a large number of instances. but you have incurred no loss. Your duplicate inspection card is given the owner and he will have a clear picture of what is needed. He will proceed towards his destination, but at the next stop en route he will go direct to the maintenance merchant in that town and have him follow the recommendations listed on your inspection card. The fellow in the next town will do the actual repairing, and it is just as probable that the next day you will have repair work to be done on the cars that the other fellow couldn't service. His

The range of the chart is sufficient to cover all details of a car that are liable to give trouble on the road. A goodly percentage of tourists are willing to pay a reasonable sum for a service that will insure freedom from delays on the road. As most of the repairs necessary on a long trip are caused by the effects of road vibration and as the en route inspection chart is largely a testing and tightening proposition, it will appeal to the reasonable-minded owner. The fact that a capable mechanic can do the inspection in one hour and that it can be sold profitably at \$1.50 are further reasons to believe that no great trouble will be encountered in making the sale.

In the make up of the picture section for this issue, MOTOR AGE has been materially aided by The Chicago Motor Club, Motor Life, The United States Touring Information Bureau and the Portland Cement Assn.

Tires for Touring

An Often Overlooked Source of Profit. Replacement This Year Will Run to the Amazing Total of Six Hundred and Twenty Million Dollars, of Which Every Dealer Should Get His Share

IMES certainly have changed for the car driving public since the advent of the cord tire. It is singular, also, that coincident with the inception of the present day pneumatic there should occur a change in respect to the car itself. THE CHANGE HAS BEEN AN IMPROVEMENT IN BOTH.

Perhaps it is because tires are so much better today than they were eight years ago that so little is heard of them. It is a fact that a poor product gets more and quicker publicity than a good one, and maybe that is why the average motorist gives no more thought to his tires than he does to his carbureter.

The car owner of today has a car which is a very dependable form of transportation and as such it is subject to the same elements as any of the older forms of transportation. One of these inevitable elements is wear, and the tires of the motor vehicle are not exempt. All other rolling parts of the car mechanism are lubricated, but the tires of the car are not. The shoes that a man wears serve much the same purpose as the tires in motor vehicle transportation, and tires are as necessary to motor transportation as shoes are to the pedestrian. It is indeed an elementary thought, but it serves as something to tie to in these days of 12,000 miles on a

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Production and Demand

The president of a nationally known tire concern recently stated that approximately 45 million (45,000,000) tires will be required this year for the equipping of new cars and for replacement purposes. Some idea of the probable volume for 1923 is available from the statistics so far compiled.

Pneumatic Casings (for the month of January, 1923)—Production, 3,-127,270; shipments, 2,994,297.

Inner Tubes—Production, 3,951,-885; shipments, 3,748,651.

Solid Tires — Production, 83,343; shipments, 60,611.

"Shipments" include only stock forwarded to a purchaser, and do not include stock forwarded to a warehouse, branch, or on a consignment basis.

The amounts given are from 66 manufacturers (members of the Rubber Association of America) out of a total of 160 firms manufacturing tires. This estimate is reasonable when you consider that approximately 3,000,000 cars will be produced this year. The new car output will require at least 13,000,000 tires, leaving a balance of 32,000,000 for the cars now in use. Figured on an average of \$20 per tire, the replacement re-

quirements will mean an expenditure of \$620,000,000 (six hundred and twenty million dollars).

Presenting the Case

Tires are a staple article of automotive merchandise; nevertheless, only a few maintenance merchants have considered their merchandising possibilities. The tire dealers have had many problems to face in the last two years and because a lot of them have failed, a sort of prejudice has grown up regarding the tire selling business. The so-called "gyp" tire and an era of overproduction were the dominant factors in producing these problems. The rising cost of raw materials and the conservative policy of banking institutions is slowly yet surely eliminating the "gyp" factor. The large producers of tires have modified their policies regarding production and are operating on sounder principles than ever before. The problems of distribution of the product are receiving more thought and the dealer's margin is more generous. (It is interesting to note that the number of firms producing tires has been decreased from 185 in 1920 to 160 in January, 1923).

The selling of tires has not always been considered in the right light. To some individuals it has appealed as something akin to a gold mine; others have carried tires in stock only as a matter of necessity. Both of these viewpoints are inaccurate and show a lack of knowledge of the present status of tire retailing.

Tires are to the automotive merchant what collars are to the haberdasher. No successful retail haberdasher would consider building a profitable business on collars alone, although the margin of profit on collars is a reasonable one. Neither would he consider a haberdashery business that did not include a stock of collars. In other words, the man who is making a profit on tires, does not sell tires exclusively, he does not levy the cost of overhead on one product, but carries in stock kindred merchandise.

The attitude of the large producers of tires is not an attitude of discrimination against the merchant who deals in maintenance. The tendency at present is for the manufacturers to choose their distribution outlets from among those dealers who have proved their capacity to make use of at least the rudiments of retail merchandising—WHO CAN KEEP THEIR STORES CLEAN; WHO CAN ARRANGE THEIR STOCKS IN SOME SORT OF SYSTEMATIC ORDER, AND WHO PRESENT A STORE INTERIOR

TO THE TIRE BUYING PUBLIC WHICH IS NEAT AND ATTRACTIVE. To such dealers, regardless of whether they are engaged in the sale of accessories and maintenance or accessories alone, the manufacturers offer a very reasonable margin of profit.

The sales agreements between the retail dealer and manufacturer show no great variation, among the large companies at least. Usually there are two classes of dealers on the list of the manufacturer. One is the dealer who buys only those tires that are required at the moment. The other is the contract dealer who has agreed to purchase a certain minimum number of tires for a year.

Few of the large companies have attempted to force methods on the dealer that are unwelcome to him. The average discount to the contract dealer is usually from 5 to 10 per cent greater than to the unattached dealer and the contract dealer generally is allowed to purchase tires on the deferred payment plan. Dealers operating under the deferred plan may purchase tires in January and withhold payment for them until May.

We said before that the cord tire of today is such an improved product that the car-owning public was inclined to forget the existence of tires on their cars. In the face of this statement, the most conservative tire distributors do not expect a reduction in the number of tires sold this year as compared to previous years. The reason is because more miles will be traveled by motor vehicles this year than ever before. More miles of travel of each vehicle means more tires to be sold and most of them will be sold by the retail dealer.

To make the picture clearer, it is known that the car of today is a better vehicle than the car of five years ago; the price of cars is lower than ever before, and, generally speaking, financial conditions are better. Bus transportation is increasing in popularity and thousands of new owners of new cars, and old owners of new and old cars, will travel via rubber-tired vehicles to their respective vacationing places. The sum of this mileage (which, is believed, will be greater than any previous year), divided by, say, 10,000 miles, will give an approximation of the tires required.

THERE IS ONE THING, ABOVE ALL OTHERS, THAT EVERY PERSON CONNECTED WITH THE AUTOMOTIVE INDUSTRY SHOULD BOOST, AND THAT IS TOURING. Investigation of reputable concerns has shown that whenever a man toured, he has doubled his season's

Tire Sizes and Passenger Cars That Use Them

From The Tire Rate Book, January, 1923

It has always been a problem with the dealer to know best what sizes and styles of tires he should stock. In the following information we hope to assist the trade by listing the various cars beneath the size which it uses as standard equipment.

The data represents cars made during

the last five years and, while some have since been orphaned, many are still in operation and due consideration must be given them.

1920 1.22	10110 #1118	intolination we hope	C GO CHODADO	The division of the				
Pennsy				Studebaker				Pan-American
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1921 1922 1922 1922 1922 1922 1922 1922 1923	1920 to 23		1917					
1925 1925	1001		1017					
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1925 1941 10			1917 18					
1915 1916			1311-10					Sheridan
1917-15			1914 to 18	Dispatch				Stanwood
1911 190				31 x 4				
1917-18			1916-17	Bell				
1917 Saxon	1913 to 21	Ford	1920 to 22					
1917-12								
1921					1917-18		1919 to 21	
	1921-22							
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1917 Amps 1921							1918	
1917 Ams Sterling 1922 Jewett 1917 to 20 Pilot 1917 to 19 1918	1922		1922 1920 to 22		1917 1920 to 99	Piedmont		
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1915 to 12 Birch 1922 Liberty 1920 to 22 Raiely 1921 to 15 Chalmers 1921 to 16 Chalmers 1921 to 17 Chardrod 1922 to 18 Cha								Buick
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1922	Metropolitan	1918	Stearns	1017		1920 to 22	
1920	Moon	1919 to 22	Stephens Salient Six			1922	Mercury
1920 to 22	National	1919 to 22	Studebaker	1918		1922	Metropolitan
1920 to 22	Noma	1918-19	Velie	1918-19		1922	Mitchell
1918	Oldsmobile	1922	Velie	1916 to 18		1922	Murray-Mac
1921-22	Paragon	1921-22	Vogue	1922		1922	Northway
1922	Paterson	1917-18	Willys-Knight	1917		1920 to 22	Ogren
1920-21	Phianna	1918	Willys	1917-18	Haynes	1921-22	Pierce-Arrow
1921-22	Pilot			1917 to 19	Hudson	1922	Premier
1918 to 22	Premier		34 x 41/2	1917	Hupmobile	1921-22	Rolls-Royce
1920 to 22	R. & V. Knight	1920-22	Apperson	1917-18	Jordan	1922	Rotary
1921	Raleigh	1917	Auburn	1917	Kissel Kar	1922	Severin
1922	Rauch Lang (Elec.)	1916 to 18	Austin	1917		1921	Sheridan
1918	Revere	1921	Baker Steamer	1918		1920	Singer
1920 to 22	Revere	1916 to 20	Brewster	1917-18		1922	Sterling-Knight
1922	Richelieu	1918 to 22	Buick	1917 to 19		1917	Stutz
	Roamer	1918 to 21		1917 to 19		1920-21	Wasp
1918 to 22		1921	Cameron	1917-18	Peerless	1320-21	
1921	Severin	1920 to 22	Cameron	1917-18	TO 1		35 x 5
1922	Southern	1918	Chalmers	1917	33	1918 to 21	Cadillac
1922	Stanley Steamer				70	1917	Charter Oak
1921-22	Stanwood	1920 to 22	Chandler	1917	Ross	1917	Cunningham
1920 to 22	Stewart	1917 to 22	Daniels	1916-17	Standard	1920 to 22	Cunningham
1918 to 22	Stutz	1917 to 19	Davis	1917-18	Stanley Steamer	1918	Doble-Detroit (St'm)
1922	Velie	1917-18	Detroit (Elec.)	1917-18	Stearns	1917 to 22	Locomobile
1918 to 22	Westcott	1918	Ghent	1917	Velie	1916 to 22	McFarlan
1922	Wills-Sainte Claire	1917-18	Hal	1917	Westcott	1916 to 18	Mercer
1922	Winther	1917 to 22	Haynes	1917-18	Woods	1922	Murray-Mac
1920-21	Wolverine	1920 to 22	Holmes		36 x 41/2	1917-18	Owen Magnetic
		1920 to 22	Hudson	1916-17	Cadillac	1920-21	Owen-Magnetic
	33 x 4½	1917-18	Kissel Kar	1916 to 18	Dorris	1917 to 22	Packard
1917	Abbott	1918-19	Lancia	1916-17	F. R. P.	1917 to 21	Pierce-Arrow
1922	Ace	1919	Lenox	1921	Y 1 4	1920-21	Porter
1920 to 22	American Six	1921		1917-18	Y	1920-21	
1922	Auburn	1917	McLaughlin	1917-18	Y l		Prado .
1917 to 19	Biddle		Marmon	1915 to 17	Pierce-Arrow	1920 to 22	Rock Falls
1919 to 22	Bour-Davis	1915 to 18	Mercer	1916 to 20	TO 1 T (TT) 5	1916-17	Singer
1919 to 21	Chalmers	1917 to 20	Murray	1916-17	Simplex	1919	Singer
1920-21	Comet Six	1918 to 22	Nash	1916 to 19	Winton	1921 - 22	Stevens-Duryea
1920-21	Crawford	1917 to 19	National	1916 to 19		1922	Wharton
1917-18		1917	Oakland	1921	32 x 5	1918-19	White
	Detroit (Elec.)	1918	Ogren	1921	Duesenberg	1919	Willys-Knight
1917 to 19		1917-18	Ohio (Elec.)		33 x 5	1919 to 22	Winton
1916-17	F. R. P.	1919	Oldsmobile	1920 to 22	Ambassador		36 x 5
1921	Geronimo	1917	Owen Magnetic	1922	Cadillac	1916-17	F. R. P.
1922	Grant	1919	Paige	1918	Cole	1310-11	
1918	Jordan	1918 to 22	Peerless	1920 to 22	Cole		37 x 5
1922	Kelsey	1921	Phianna	1921	Colinet	1917	Cunningham
1921-22	Liberty	1917 to 20		1922	Colonial	1917-18	Locomobile
1918	Mitchell		Pierce-Arrow	1922	Cunningham	1915 to 17	Lyons-Knight
1918	Ohio (Elec.)	1915 to 17	Reo	1922	Daniels	1915 to 17	Pierce-Arrow
1918 to 22		1918	Roamer	1920 to 22	Dorris	1916-17	Simplex
1921-22	Packard	1918 to 22	Standard	1921	Duesenberg	1917	White
1919-20	Paige	1917	Stanley Steamer	1921-22	Handley-Knight	1916 to 19	Winton
1922	Paige	1919 to 21	Stanley Steamer	1922	Heifner		36 x 51/2
1918-19	Pan-American	1919 to 22	Stearns	1921-22	Jacquet	1917-18	Pierce-Arrow
1920-21	Premocar	1916-17	Stutz		Lafayette		38 x 51/2
1922	Raleigh	1917	White	1920 to 22	Lincoln	1915 to 17	
1922	Ranger "Four"	1917 to 19		1919 to 22		1010 10 11	34 x 6
	ranger rour			1313 10 22			
1916 40 91	Rauch & Lang (Elec.	11921-22	Willys-Knight	1917 to 22	Marmon	1920-21	Ri-Chard

DECIMAL EQUIVALENTS

	1	Decimal
Combined	Percentages E	quivalent
25% =		25
25% + 5%	=	2875
25% + 5%	+ 5% =	32312
25% + 5%	+ 5% + 5% =	35697
25% + 10%	=	325
25% + 10%		
25% + 10%	+ 5% =	35875
25% + 10%	+5% + 5% =	39081
	+ 5% + 5% + 5% =	42127
20% =	***********************************	20
20% + 5%	=	24
20% + 5%	+ 5% =	278
20% + 5%	+5% + 5% =	3141
20% + 10%		28
20% + 10%	+ 10% =	352
20% + 10%	+ 5% =	316
20% + 10%	+5% + 5% =	3502
20% + 10%	+ 5% + 5% + 5%	38269

mileage, and mileage is what is needed to double the car owner's potential value to the industry.

Since volume of tire sales is dependent on miles traveled, and mileage is largely a matter of touring, the legitimate tire season is the touring season.

Thoughts on Preparation

No unusual facilities are necessary in selling during the touring season; nevertheless, it is the time when the wise merchant will put forth his best effort. Just as in the sale of maintenance, he should be prepared mentally and materially.

First, he should see to it that he has an adequate but well chosen stock of casings, tubes, repair materials and tire accessories. The salesman of the tire manufacturer from whom he buys is always ready to suggest a well balanced variety of sizes and will have available appropriate advertising material.

SMALL QUANTITY WIDE RANGE STOCK WILL ACCOMMODATE 90 PER CENT OF CARS

uantity		
2	30x3	Cl. Fabric
6	30x31/2	Cl. Fabric
8	30x31/2	Cl. Cord
6	30x31/2	S. B. Cord
4	31x4	S. B. Cord
4	32x4	S. B. Non-Skid Cord
4	32x41/2	S. B. Non-Skid Cord
4	33x4	S. B. Non-Skid Cord
4	33x41/2	S. B. Non-Skid Cord
2	34x4	S. B. Non-Skid Cord
2	34x41/2	S. B. Non-Skid Cord
2	33x5	S. B. Non-Skid Cord
2	35x5	S. B. Non-Skid Cord

Above is a typical summer stock that will take care of the tire requirements of over 90 per cent of the different makes of cars that will be on the road this summer. Such an assortment will permit of a rapid turnover and represents an investment of about \$1400.

The quantity of each size carried as listed may seem too great to the very small establishment; however, regardless of the size of the establishment, the dealer should carry at least one of each size listed. The same holds true of inner tubes. The chart inserted on these pages will be of use in making up a stock for your vicinity.

It is indeed a backward dealer who does not realize the direct benefits of free air and water for the motorist. Worked in conjunction with the curb gasoline pump, they are the means of communication between the tourist and the establishment. One of the biggest reasons for the patronage of the exclusive filling station is the prompt service received. The average car owner will pick out a place to replenish his gasoline supply where there is an attendant visible, because he doesn't care to toot his horn to attract the attention of someone out of sight in the back of the building.

It is when the tourist is being serviced for air, water, or gas that the mental perparedness of the merchant should be applied. Then is the time when the man who is in a strange country is most

(Concluded on page 26)

Spring Business for the Electrical Shop

Much of It Goes by Your Front Window. Is the Appearance of Your Place an Invitation to Stop, Look and Purchase?

By A. H. PACKER

Between the snow and the spring time, When things begin to boom, Comes a time of slush and rain time And a time of business gloom.

If you just look at the weather And warm up the seat of a chair And look at the papers that gather On the showcase and everywhere.

Then the spiders will hold a meeting And spin their webs about, And the folks you should be greeting Will decide that you are out.

So figure a dozen owners
Will be in, in an hour or two
And brush up and slick up, and fix the place
As your wife would want you to.

And make your window a salesman, You can do the trick if you try, And the folks will stop, look and listen And then come on in and buy.

THERE are two kinds of men running electrical shops, the ones who look at today and those who look ahead. The first is all enthusiasm and pep when he has sold a battery or two, but when it rains he is down in the mouth, discouraged and blue. A dozen jobs are in his shop, if he would only have the courage to tackle them, but his spirits sag so that he hasn't the heart.

He has been figuring for a long time that some day, yes, he puts it that way, some day he would make up a big sign, have it brightly illuminated and put up on the top of his building. Then somehow when a breathing spell comes along, he just doesn't do it.

But they are not all that way. The men in the big places are not like that. A job that does not come in is just an opportunity to get out some display or piece of advertising that will make two jobs grow where but one blossomed before. Their shop may not always have been a big one, but alertness to opportunity has made it so.

What to Do

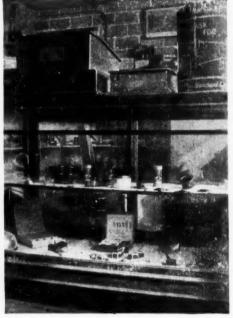
When a breathing spell comes in your business, make your charging outfit work in bringing your rentals up to their best condition. Test each rental battery with your discharge tester and if any are ready to go bad on a customer's car, tear them down. Fix them right and save yourself and your customer some trouble.

Then put on your coat and hat. Walk up one side of the street and down the other, wherever you can get a glimpse of your shop. Pretend you are a car owner and you are trying to decide whether to take a chance on running your car in there. If the looks of the place make you doubt the ability of the man inside, then ask yourself how you ever expect to get any tourist business. The tourist does not know you. He has nothing to judge by but the appearance of your place of business. On that basis you will be approved or condemned.

Then if you are not entirely sure that the casual observer would be attracted to your place, see if you can figure out why. Is it the same in general appearance as all the other dumps along the street, or does it stand out. Perhaps you can not



Is your show case full of empty boxes and junk?



Do a few things well displayed make

A REAL SHOW CASE

(Before and after it had a spring renovating)

immediately build a new imposing structure, but how about a coat of paint. Adopt a standard color that will be your trade mark. Use it on your shop and on your service car. Make it red, with yellow trimmings, or yellow with blue trimming, perhaps not artistic, but striking at any rate.

You will at least get a second look from the passing cars. In that look there may be a realization of some service or material needed, and business will be drawn to you.

Then take a closer view. Does the sign tell your story, and do your windows work for you, or are they resting places for ten penny nails and old fan belts, scraps of wire and dirty rags.

There is a certain hardware store where you do not get hardware, you get hardware and service. The purchase of a pair of hinges will give you not only the material you need, but a hint or two as to the best way to put them on. The man behind the counter knows and he tells you if you need his help. If you buy a lock, he can tell you the best way to install it, just how to cut the door, what size hole to bore, and you put the lock on and are satisfied. When you want another you come back to him.

Service to Your Customers

The electrical shop proprietor has a similar opportunity to be of service to the car owners in his community and to profit accordingly. Lack of information costs the car owner a lot of money each year. Numerous frozen radiators during the past winter have illustrated this fact, car owners putting in a pint of alcohol, not knowing that the correct proportion required probably a gallon and a half.

Trouble with the electrical equipment on the car often comes similarly from lack of knowledge, and the shop that makes it a point to give constructive information, will make friends and increase the totals on the cash register. In the smaller com-

munities the campaign by mail is doubtless as effectual as any way of getting the attention of car owners. Here a number of points should be kept in mind.

Do not send out an appeal just asking people to "Buy Blanke Batteries." It doesn't mean much. If you do it frequently, you may impress the name on a number of prospective purchasers and may eventually make some sales. There are, however, much better ways of presenting yourself and your shop to the car owners in your vicinity.

One of the factors of human nature to which advertisers appeal, is curiosity. A card sent out, with an appeal to this human trait will act as a good foundation for future appeals of a more constructive nature. One small shop sent out postal cards, with this question only, "WHO IS GERALD FARBER"?

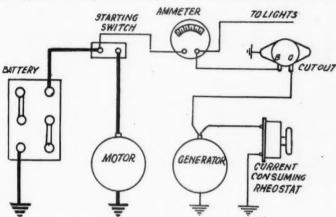


Fig. 1
Installation of current consuming rheostat, when generator is provided with a separate cutout

That wasn't the name of the man, but that is the name we will give him.

A short time later a wet wash wagon driver was picking up a load of laundry in a small community 16 miles away, and his customer said to him, "Say, do you know who that fellow, Gerald Farber is; look at this card, it came from your town." The wet wash driver had been to the local electrical station and thought he knew the name of the proprietor but wasn't sure. He said:

"I believe that must be the name of the man that runs the new electrical shop in our town, I'll find out, and let you know next time I see you."

Will not the receiver of that card read with interest the next communication he gets from Gerald?

Yes, the next card sent out satisfied the curiosity and invited a reading of all it contained. It said that expert knowledge combined with up-to-date equipment made it possible to render starting, generator, ignition and battery service on a guarantee basis at the lowest possible cost. Following this card was a letter sent a week or so later, and its appeal was on the basis of money saved, the wisdom and economy of patronizing an expert.

The Spring Letter

Now comes the big opportunity, when by word of mouth and letters to car owners you can give them advice that will put money in your pockets while saving some for them. The winter season has required the maximum generator output of which the machine was capable, to insure having a charged battery at all times. Many electrical stations in the fall have boosted the charging rates on their customers' cars, because for that time of the year it was the right thing to do.

With these higher charging rates in summer, however, both the generator and battery overheat. In the generator the extreme condition may be reached when commutator solder is melted and the wires fly out, ruining the generator and requiring both extensive and expensive repairs. In the battery excessive overcharge loosens the active material from the plates, thus shortening the life of the battery. It also evaporates the water faster, and according to prevalent theories tends to buckle the plates, thus cutting through the separators and shorting the cells.

Then make your appeal to the car owner on the basis that

prevention of trouble in summer is facilitated by a spring inspection. Offer them a free test, if you feel this will bring the business to your doors. Tell them it is better to locate trouble before they leave for the lakes, than when they are on the way there.

Then do not bluff it through. Equip yourself for the job and do it right. Don't say just from looking at the case of a battery that a new one is needed. The next fellow may have a discharge outfit and show you up. The meters tell the story. The shorted cell will give way before their evidence, and the facts can be read by the customer, for meters do not lie.

Adjust the Charging Rate

Confidence brings business and seeing for themselves gives the car owner confidence that you are on the square. Be fair to yourself by being fair to your customer. If the meters show a minute variation on the different cells do not try to bluff your prospect into buying a new battery. He may not know just then that you are putting one over but he will eventually. When he finds out you will have killed the whole selling activity of your shop equipment.

After checking the battery, you should readjust the generator output. On third brush and voltage regulator type machines this is possible, while on series field machines it can not be done to any marked degree.

If you have your Motor Age of Nov. 2, 1922, you will also have a chart showing many of the adjustments on different types of generators. We gave you this so that you could boost the outputs for winter driving. For the summer you can now reverse the process. On 6-volt cars winter conditions make it possible to use from 15 to 20 amperes while the same cars in summer should have in the neighborhood of 10 or 12 amperes.

This applies to average summer use but may be found too much for touring when the car is driven all day for a week or so at a time. Here the electrician will have to consider individual conditions. If the machine has the third brush type of regulation or has a regulator, the owner should be told to come in for a special adjustment just before going on his trip. If, however, he has a machine in which the output can not easily be regulated, or if his touring is going to be intermittent through the summer, then he should be shown the advantage of having an adjustable resistance installed on the dash.

The method of making the installation of such a resistance or rheostat, varies with the electrical system on the car. In Fig. 1 the method of connecting is given for those cars on which a generator is used, and a separate cutout is provided for the generator. It will be seen that with the engine standing, the resistance has no effect, as both it and the generator are disconnected from the battery. When the generator charges, however, a portion of its output will be consumed in the rheostat, so that the current going to battery may be varied at will by turning the handle of the rheostat.

The same scheme of connections may be used if a separate cutout is used, mounted on top of the generator, but care must be used to see that connection is made to the generator terminal and not to the terminal which connects through the ammeter to live battery. The Ford car has a generator which illustrates this point.

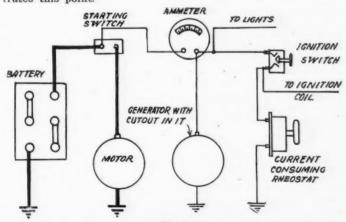


Fig. 2
Installation of current consuming rheostat, when cutout is built inside the generator

Some generators are built with the cutout inside so that it is impractical to try to use the connections of Fig. 1. Under these circumstances we can resort to the method shown in Fig. 2, where the rheostat is connected to the ignition coil side of the ignition switch. We know that when the engine is standing this switch is open, and therefore no current from the battery can flow to the resistance. When the ignition switch is turned on, battery current will flow to the rheostat for a few moments until the engine starts. Then the generator current will flow to this resistance. When the engine is stopped it is done by opening the ignition switch, which not only cuts off current from the coil but also from the rheostat.

One other case comes up, in connection with cars having Delco motor generators, where one terminal of the machine is connected to live battery. On these there is no starter switch, but the lowering of one of the starter brushes serves the same purpose. Operation of the ignition switch serves to carry battery current to the ignition coil and to the armature and field terminals of the generator portion of the machine. We can, accordingly, connect the rheostat to the "A" terminal of such motor generators with satisfactory results, the rheostat being cut off from the battery at the same time the ignition circuit is opened.

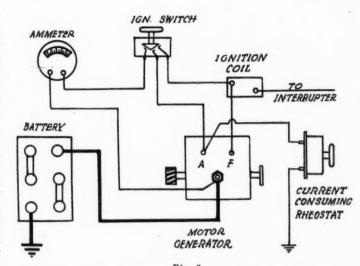


Fig. 3
Installation of current consuming rheostat, when car has a Delco motor generator such as on Buick or Hudson

(Continued from page 23)

easily approached. Above all, the person who dispenses the gasoline should be pleasant and his next most necessary virtue is a keen "sense of observation." Such a fellow will give the little added attention that cheers the heart and increases sales. He will, without a perceptible effort, take in the condition of the tires and suggest the necessity of inflation, or acquaint the owner of the fact that one of the front tires is wearing prematurely, due to misalignment of the wheels.

Maybe the spares are punctured, perhaps the man should have an extra tube, or the guest would appreciate a drink of cold water. He will have on tap instant information on the condition of the neighboring highways and a knowledge of the distance between all the towns en route.

One of the fundamentals of selling is to acquaint the public with where your establishment is located. If you have not any attention-attracting signs on the highways, they should be erected now. before the season is in full swing. There are road signs, and road signs, but not all of them have the ability to attract the attention of a passing car driver. Their position relative to the road and the color scheme are big factors and any good sign painter can offer advice as to the layout that will talk the loudest. Signs are but one form of inexpensive advertising, the other mediums may be taken advantage of at little expense because the tire manufacturer is given close cooperation, such as local newspaper cuts, window displays, flange signs, wall signs.

A Word About Inflation

In the very recent past and even now we hear on every side the necessity of proper inflation. Usually these warnings, propaganda or instructions are to the effect that the tendency of the average owner is to under inflate. There may be cases of under inflation, but just now

when the tendency is toward oversizing the tire equipment, there is danger of overinflation.

The matter of inflation is of paramount importance, but the practice of inflating oversize cord tires to inordinately high pressures is a mistake. Tires of a certain cross-sectional area will support a certain load at a certain pressure with a given amount of deflection of the side walls. Today we find 4½ in. tires where only 4 in. tires were formerly used. Inasmuch as these 4½ in. tires will carry as much load as the 4 in. tire originally used, they should be permitted a lower inflation pressure, since excessive deflection is what we are trying to avoid in recommending ANY given inflation pressure.

In other words, if we take the case of a 5 in. tire with a normal load capacity of 1700 lbs. at 90 lbs. pressure and install the same tire on a car where the normal load is one-fourth less or, say, 1425 lbs., it should be inflated to ¾ of the normal pressure, or 68 lbs. The subject of inflation is brought up here because quite often the purchaser of a new tire in his zeal to live up to what he considers the right care of his tires, will overinflate.

Overinflation is not dangerous to the tire itself, but produces a hard riding car, and the consequent vibration on the chassis mechanism is responsible for a premature visit to the repair shop. The retail merchant has the opportunity of more intimate contact with the tire consumer and if he knows his business he will find out the make and model of the car and, knowing the characteristics of the tire he sells, will advise the proper inflation pressure.

With a steady decrease in the number of companies producing tires, it is becoming increasingly evident that the successful tire dealer of the future will have a connection with a reputable concern. This tire factory connection will permit of complete stocks being kept on a small investment and rapid turn-over

of stock will permit him to increase his business with the minimum increase in his investment.

There is money to be made in tires and the public is better able to pay a reasonable price for tires now than at any time during the last two years. The motorist who has done any amount of touring is less concerned with a small difference in price than he is with assurance that he will have uniform quality which is difficult to find in the too cheap tire.

The dealer can meet the summer demand with a high grade tire which he should sell on a definite and clearly understood basis. He should establish in his own mind the sales policy that he knows he can live up to and then adhere to this policy. When the dealer has decided on a sensible policy, the sale of a tire becomes a business transaction instead of the old-fashioned dicker and trade-the customer has more respect for the dealer and for the tire he buys. The time of both the dealer and the customer is conserved and retail tire merchandising becomes a well organized and profitable business instead of an uncertain venture in which the dealer seldom knows whether he is making or losing money.

BUSINESS GOOD, SAY A. E. A. MEN

NEW YORK, March 31—Jobbers from various sections of the United States and Canada who have been attending a meeting of the board of directors of the Automotive Equipment Association report both shop equipment and accessory business running ahead of last year. The Middle West and Rocky Mountain sections are doing considerably more business than a year ago and in some setcions of the south the increase is phenomenal.

Indications as spring opens are for a big year in the automotive equipment field, with decidedly improved dealer credits as one of the bright spots in the outlook.

Maintenance to Sell the Tourist

The Automotive Shop of the Country Dealer Especially Should Be Prepared to Handle Emergency Repairs. The Tourist Usually Is in a Hurry to Go On and Speed Is Necessary to Keep Him Satisfied. Better to Make a Temporary Repair Than No Repair at All. Shop Should Be Stocked with Material for Making Parts

THERE always will be some repair and maintenance jobs coming into the service station of the small town dealer especially, which call for resourcefulness on the part of the shop men. The tow car brings in a car some night on which front spring has been broken and for which there is no suitable spring in the shop's stock. The car owner is anxious to go on and sort of leaves it to the ingenuity of the shop men to make this possible.

Then again, there might be a car with a smashed gasoline tank, the result of a rear end collision. There is no tank in stock to fit. The car owner does not want to be tied up for perhaps several days awaiting the arrival of a new tank. Maybe a new tank is available in a larger city some hundred miles or so away. How to get there with the disabled car is the problem in this case.

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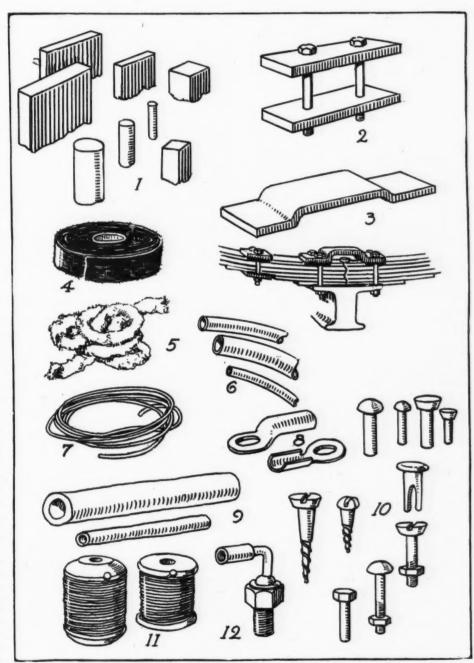
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Maybe the particular job in question is one of a broken radiator tank, a fuel line, king bolt in one of the steering knuckles or some other trouble. These jobs are sure to spring up and as long as they do there must be some provision made to take care of them. Certainly it would be a lamentable thing to tell a tourist that you could do nothing for

A temporary repair is certainly better than no repair. Making a bracket for temporarily holding in place a broken front spring is far better than telling a tourist he can leave his car if he wants to until you can have a spring shipped to you. If one leaf is broken, the local blacksmith can weld it. The well-tooled shop, of course, is in a better position to take care of unusual cases of trouble, or cases wherein new parts are not immediately available, because such a shop has the facilities for making parts.

It is well to always bear in mind that in nine cases out of ten the tourist is in a hurry to be on his way and that, anything, therefore, which can be done to speed up the making of the necessary repairs, whether these be permanent or temporary, will be appreciated by him.

For that reason the shop should have on hand certain things that are quite sure to be needed. A lot of time is lost when a mechanic has to search around in his "junk" to see what he can find that might be effective in making a repair. A case is recalled wherein a mechanic spent a good many minutes trying to find a piece of band iron from which to make a bracket for a broken



Here are shown some of the most necessary things which the shop must have in stock for effecting repairs, temporary or otherwise, on tourists' cars. 1—Bar stock, flat, round and square. 2-3—Clamps for broken springs. These should be made up in various sizes, so no time will be lost when a customer drives in with a broken spring. 4—Friction tape, always useful. 5—Asbestos packing, for leaky exhaust pipes. 6—Copper tubing. 7—Brass Spring wire, to replace broken choke wire and make coil springs. 8—Starter terminals. 9—Cored bronze bars, for making bushings. 10—Rivets, screws, bolts. 11—Wire, in coils and on spools. 11-12—Spark and throttle operating rod ball joints

front spring. He finally had to walk down to the blacksmith shop several blocks away to get what he was after.

It is not within the scope of an article like this to tell just what materials should be stocked in the automotive shop of the small town dealer, but we believe the following will be found useful. Nothing is listed but what will come in handy at some time or other and the best part of it is there is no great expense involved in the purchase of the material.

BARS, RODS, SQUARE STOCK, ETC.—This sort of material always comes in handy for making brackets, emergency spring clips, and many other things. The flat stock or band iron stock can be bought in varying widths and thicknesses and as a rule three thicknesses, ½, 3/16 and ¼ in., will take care of all demands. The widths might be 1, 1¼ and 1½ in. This flat stock is useful in making brackets for bodies and it is possible to make a storage battery carrier out of the 3/16 by 1¼ in. stock.

Rods or the cylindrical stock can also be had in any size, but here again, a few sizes like ½, 3/16, ¼, ¾ and ½ in. will take care of most demands. A fairly good axle clip can be made out of the ½ in. round stock and while it will not be as good as the forged variety which come already made up, it will help to get the tourist on his way until a permanent repair can be effected.

Square stock, as the name implies, has a square cross section and, like the other materials, can be had in any sizes. All of this material can be bought from a blacksmith, if necessary, but the better way is to buy it from a concern dealing in iron and steel.

TAPE.—It may sound strange to many that we should specify such an obviously necessary commodity as friction tape, yet it is often the obvious things which are overlooked. Tape is about as handy around the automotive shop as a vise itself. The uses of tape are too numerous to mention, so suffice here that we say a good supply of it should be on hand at all times. All of us have heard the expression, "We can tape it up temporarily for you" around the shop, so be sure that your shop is fixed to do this when the caravan of tourists begins.

ASBESTOS CORD PACKING.—Every now and then a person drives in with a car and complains that the exhaust gases get into the driving compartment through the floor boards. Or, they say the floor boards get too hot. For getting around such difficulties, asbestos cord packing will be found useful. It can be used as a stuffing material in the gland of the exhaust pipe or it can be wrapped around the pipe to insulate it from the floor boards. Anyway, it will come in handy at various times and the well equipped shop will not be without it.

COPPER TUBING.—As long as we use copper tubing for fuel lines and oil lines, there is going to be need for replacement. Vibration will at times cause these lines to break and often it becomes necessary to replace the line completely. Tubing also comes in handy for making repairs. For instance, a customer might

drive in with the choke wire tube broken as a result of its having been cut into by chafing against the sides of the hole in the metal dash. A choke wire will not work in a broken tube or casing. But the latter can be made as good as new by slipping over it a short length of copper tubing and soldering it in place.

SPRING WIRE.—Several coils of brass spring wire will be found useful in making repairs. The choke wire, for instance, is usually made of spring brass wire. They sometimes break and must be replaced. There are many coil springs used in the makeup of a car and if you have a spring winder and the necessary wire you easily can make coiled springs of various sizes to meet a certain demand. There are coiled springs on brake rods. on some muffler cut-outs, engine pans, throttle operating rods, etc. Of course, it is possible to buy an assortment of coil springs from supply houses and it is advisable to have such a supply on hand. But when you do run up against a job of where a coil spring is needed or the choke wire has to be replaced, it makes a customer feel good to have your shop able to fix him up.

STARTER CABLE TERMINALS.—As long as some car makers do not seem inclined to fit longer cables on their starting circuit, the terminals will crack off from vibration because the wires are too rigid owing to the short length. The only way to do a good job on a broken starter cable terminal is to solder on a new one. So when the motorist drives in with the cable taped on temporarily, be sure that in your stock of electrical parts there is a sufficient number of starter cable terminals.

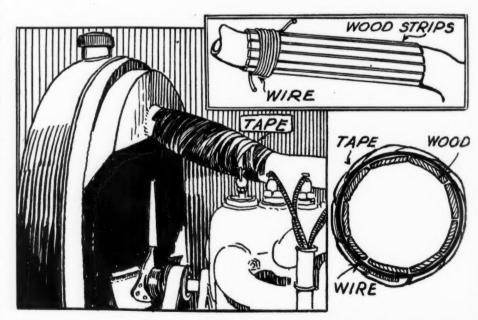
CORED BARS.—The small town shop cannot carry in stock bushings to fit every make of car, but it can, if there is a lathe in the shop, carry cored bars of bronze from which to make bushings. It does not take very long to turn up a bushing when all the facilities are on hand and next to the lathe and drill press, the cored bars are the most essential things to have.

We recall a case where a car was driven into a small town shop and the driver complained that the car was difficult to steer. Inspection showed that the tie rod yoke bushings were badly worn and it was impossible to take up the wear by the bolt and nut. A new bushing in each end of the rod was the only remedy. New ones were not available, as this car was an old timer. But the shop was well tooled up and carried enough raw stock from which it could make most anything. So the mechanic turned up a piece in the lathe, cut it in two and soon had new business for the tie rod.

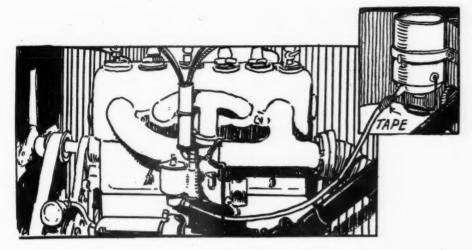
BOLTS, RIVETS, SCREWS, CAP SCREWS, ETC.—Again it seems almost as though we should apologize for listing trifles such as bolts and screws. But, go into many a shop and look over the stock of these parts. Frequently you will find that the only stock on hand consists of bolts, screws and washers, which have been taken off cars and engines and scooped into cigar boxes. There is no thought of arranging them by sizes and types.

The best thing to do is to buy or make a rack with partitions and mark these 1/8, 3/16, etc., and then proceed to buy from the hardware store a dozen or so of each. Get an assortment of flat head and round head screws, stove bolts and carriage bolts, iron rivets, brass rivets, of the tubular and slotted types. Machine screws and cap screws are always in demand about the shop. Lay in enough of these so you do not have to tell a customer that you are sorry you have not a bolt with the correct thread on it. We assume, of course, that you will not overlook such obvious things as cotter pins, castellated nuts and lock washers.

WIRE.—Whenever you come across a veteran tourist you will always find that



A case where an emergency repair will help a car owner on his way. A substitute hose connection was made from pieces of wood, wire and tape



A smashed gasoline tank was responsible for a garage mechanic rigging up this device which consisted of a gallon gasoline can with a tube soldered to its spout

he carries plenty of wire with him. There probably are no two greater friends to a tourist who is confronted with some kind of a broken part than wire and tape.

It is possible to buy wire on spools and in coils. It looks very business-like when you see a shop in which the wire is neatly coiled and hung on pegs, or the spools of the smaller size wires are neatly grouped.

Many a temporary repair has to be made with the use of wire and it must, therefore, not be overlooked when a list is made out for purchasing necessities.

Just to show what you can do with wire, let us cite an incident. A top hose connection had become so rotted that it parted company with the rest of the car while the latter was on a long stretch of road. What to do? What to do? That was the question the motorist

asked. He was of the type who trusts to luck that everything is all right. He was pondering when a motorist drove along and who from all appearances was used to cross country driving. He sized up the situation and here's what he did:

He cut several strips of wood from a thin board he found close by. These strips were about 3/16 in. thick, 3/4 in. wide and 7 in. long. He cut eight of these and then placed them in about the same position as the hose had been. He held them in place with his left hand while with his right hand he wired them together. Then he wrapped wire closely around the whole structure after which came several layers of tape. The job was not absolutely water tight when finished, but the motorist got to the next town where a hose connection was made. The hardy motorist knew the value of tape and wire and the incident just goes

to show what you are up against some-

BALL JOINTS.—Although these break infrequently, there are times when replacement is necessary. Sometimes the threads get worn and the rod does not hold, or in extreme cases the neck of the small ball end is worn into. It is usually difficult to make any kind of a temporary repair on a broken ball joint and replacement is about the only cure. For that reason when you stock up for the summer tourist trade be sure to include a sufficient number of these ball joints for spark and throttle control.

We have attempted in the above to give some idea of the essential things to have on hand for fixing up the stranded tourist. The dealer, his mechanics or the man who runs an exclusive maintenance and repair shop must, of course, be the final judge as to what is needed for his shop, but we feel sure that no mistake will be made in seeing to it that there is at least on hand the things we have specified in these columns. No attempt has been made to list such things as lamp bulbs, spark plugs, tubes, tire valve stems, and the many other things which in the majority of cases are always to be found even in the small town dealer's establishment.

The sole purpose of this article is to set the dealer's shop to thinking about fixing up the man or woman who is touring and who wants to have a repair effected in a hurry. Some things you will have in stock for the repairs. Others must be made up and you must have the materials. Like a certain restaurant in Chicago advertises, "If you don't see what you want, we will gladly make it up for you."

Continued from page 12

There are two sources of touring information that are available which dealers may safely recommend to their owners, or from which they can get routes to supply to customers.

The National Touring Club of 1056 W. Van Buren street, Chicago, is conducted in connection with the Blue Books. Purchasers of Blue Books get a membership to this club which entitles them to special route information upon request. This service consists of individually marked maps and expert comment on the route to be followed. It is strange that so few automobile dealers have sold Blue Books, as they can be made a source of profit as well an education to the car owner. A Blue Book is always a lure to extended use of the car, and that is what the dealer should encourage.

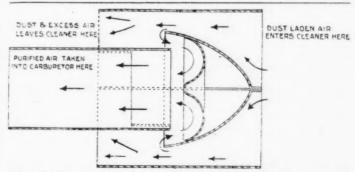
By a Special arrangement, MOTOR AGE subscribers can get the National Touring Club Service without cost to them. Any subscriber request for routes will be given prompt attention. If a dealer wants this service to pass on to his customer, this is his chance.

Another reliable source of touring information is the United States Bureau of Touring Information, Waterloo, Ia. This company specializes in touring camp information, and last summer published the first map of the motor tourist camps ever compiled in this country. It made an amazing showing of such facilities for helping the motor tourist on his way as pleasantly and economically as possible. This map has been revised for this season and should be useful to dealers who are having a sales campaign in vacation tours in used cars.

The opportunities to travel gypsy style are not lacking, as a glimpse of this map will convince the skeptic. This touring information also consists of logs for special tours at a nominal price. Up-to-date road information is included in these logs.

Dealers who care to feature a touring service should communicate with one or both of these sources of information.

An Illinois dealer in a comparatively small city last year put in a small stock of touring maps in an appropriate wall case. He put these in charge of the young woman in the office. She was quite pleased with the profits of her sales and the tourists who stopped at this place, saw the maps and purchased them, expressed appreciation of the service. A storage garage was a part of this dealer's establishment, and before the season ended he found that some of his map customers were recommending his garage to hotel and camp acquaintances.



Here is shown a cross sectional view of the air cleaner on the Rickenbacker. The course of the foreign particles in the air stream is indicated by arrows, as well as that of the cleaned air. The percentage of road dust (silicon) in carbon deposits has been variously estimated at from 15 to 75 per cent. It is safe to say the figure is high, especially in those sections of the country not as yet endowed with hard roads. Air cleaners, therefore, are beneficial

The Fable of the Bad Boy Who Just Couldn't Help It

By TOM WILDER

With apologies to George Ade

NCE upon a time there was a Repair shop on a country road just outside a town. The shop's High Priest was a hairy hard fisted He-Man with always a week's growth of beard on the outside of his face and a Chew of tobacco on the inside. He could do more Cussing to the circumference of each job than any two other repair men in Captivity and was a past master at losing his temper when a gear wouldn't come off or a thread got jammed.

In the old days of the lap weld and the Anvil chorus nothing gave him more Joy than shoeing a Mule. A Mule gave him something to think about.

He was 6 ft. high not counting the heels of his shoes, sinister as the Ace of Spades and worked from Sun-Up till long after the last village loafer had Hunted the Hay. He had a family but you would never think it from the time it took from his daily tasks, its principle function being to provide Hot meals and a place to sleep between shifts.

Two of his three children, a boy and a girl, had grown up to be quite a credit to him principally through the efforts of their Mother though it must be admitted that the Old Man, though a Rough Actor, was also a good provider and while he left all the Bringing Up to the Mother, did not hamper her in her undertakings in any way. When she wanted to send the oldest boy down to the State University, he just said "All right, Ma, you're the Doctor," and later when she wanted the girl to have some special training that would give her more advantage in the community, he merely remarked, "Darn't Ma, you didn't have none of them high falutin ideas in your head an' you got along pretty well, but maybe things is changed; do as you think best.'

The youngest boy was different; mother had been Up against it to know how to handle him. He wanted to Ditch school and get to Coining Shiners and she had to use every persuasion, every wile and every threat she could muster to keep him on the Straight and Narrow until he was through high school. She wanted him to go to College and graduate and finally get to be a famous professional man of some kind, but was forced to give it up as a Bad Job. Perhaps she thought after a year or two of rough he would be tamed and more inclined to listen to reason.

Mother didn't know just how to size up Willie, however. She didn't know that he liked the hard knocks best. His was the kind of a mind with which she was not familiar. She had tried her best to make a good boy of him, but he just couldn't be Parlor broke. He insisted on swapping knives, playing marbles for keeps, selling everything he could get his Mitts on and betting on everything



Willie wormed his way into the stockkeeper's affections

that happened in the community whether it was a horse race, dog fight or Higher up or Down.

While mother was very much upset over Willie's habits and behavior, his operations sort of tickled the Old Man, probably because Willie always Made Good on his deals. Willie always let the other Bird Hold the Bag; some way Willie always bet on a Sure Thing.

As Willie grew nearer to maturity his transactions took on a more serious nature. He would annex most anything of value from a thoroughbred pup to a sewing machine and had a knack of always being able to dispose of his purchases at a profit. Every one was his friend and he usually knew before he bought a thing where he was going to sell it. This was all very well while he was going to school, he kept himself in spending money so that with what his Dad gave him he could travel with the Fastest Steppers. But when school was past and he had all of his time to devote to Chasing the Sheckles, he found himself craving a more permanent form of business. He wanted to be a Regular Guy instead of a Hawker.

The Old Man's place was only a Repair

Shop, he sold no parts, accessories or cars. He did a good business in over-hauling but his stock of parts for this work was very limited and when a job needed new parts he had to get them from the local dealer or send to the factory if there was no dealer.

Willie had helped his father some during his vacation but the Grease and Dirt didn't make any Hit with his fastidious make-up and he resolved that when he grew up he was off'a that line. He had many times, however, heard tourists and others inquire for certain things in the accessory and parts line which general garages usually keep. This gave him a Hunch and the first opportunity he had he Sounded out the Governor on the subject much in this line:

"Dad, I believe you're overlooking the Best Bet between this town and Lost River. Here are birds with their wallets packed full of Green Babies passing at the rate of thousands per day, every one of 'em wishing he had something to make his car run better or his trip more pleasant.

"What you should have is an attractive little shrine set up out here in front where Trail Hitters could stop and Tell their Troubles, trade in a Cart wheel or two for some Guygaw or other, get an Earful of road Dope and be on their way with you enriched to the tune of your profit."

"That's all right, my son," said the old man, "but you must remember I'm no Ribbon Counter Dandy. I've made a pretty good living for your Ma an' the family and it's pretty late now to start teachin' an Old Dog new tricks, specially when we don't need so much now as we did when the family was growin' up.

"No, I'm afraid that the first City Broke Humming Bird that saw me crawl out from under some wreck and start towards 'em wiping the Carbonated Vedol from my Classic Countenance would take to the Sticks and never return.

"There ain't a chance, the business is probably there and I've often wondered how I could Cop some of it. Them days is past. I'm a repair man and that's all. I've been able to bring up a pretty good family on the profits of the old shop so I guess it will take care of your Ma an' me as long as we need anything. Besides that, if I made too much your Ma might get Fractious and start Cuttin' Capers an' that would Muss Up a perfectly Good Deal."

Willie knew perfectly well what his Pa was going to say, he had heard him say almost the same thing before, but now the plot was different and he wanted his Dad to commit himself so that he would have the Cue to go ahead and Spring his own proposition.

"Well, Dad, I guess you're right, but



it's a shame to see all this business going past. There goes a Goof right now that ought to have a new tire, it's all down to the fabric and his spare is Shot beside. If you don't want the business, suppose you give me a chance at it. Tell you what you do. Build me or let me build a little store out here in front and I'll start a business that'll pay you and me, too."

"If I thought you was in earnest," said Dad, "I'd back you, but you are pretty young to be Tied Down to store keeping and I'm afraid I'd get the thing all fixed up and stocked up an' you'd decide the real estate or some other business was better and I would have an elegant store on my hands and no one to run it. What assurance have I got that you will Stick?"

"Just this, Dad, I've got to make some money and I can't make enough to suit myself working for someone else. All I want is a chance and I'd show you a few tricks. Loosen up and build me a store and I'll live on a Grub Stake till I pay back every cent you invest."

"I believe you're honest in your ideas and I'm itchin' to give you a Boost, but you don't know nothin' about accessories and I don't know much more. If we go in together we would most likely Wise Up on a few things to our Sorrow. I'll make you a proposition, though, and if you make good we'll build the slickest store on the Maridian Pike. Then if you make good with the store I'll turn over the shop to you; I'm gettin' kinda old to be doin' these Gimnastics—and you can call it a Service Station and take on a car or two and be a regular honest t' gosh Dealer, wear good clothes an' go to conventions.

"Here's the Dope. It's too late now to get started this year and it's too early to start to get ready for next. You might as well profit by someone else's experience as to fight it out all alone. Get a job with Henry Kooms or if you can't bust in there, go over to Spring Crick where they don't know you. Learn the business, but hurry up about it. There isn't much of the season left. You will probably get Canned by Thanksgiving. If you stick till then and still have the same Bug in your Bean, we'll work out some plans.

"I've got that 160-acre lot that I always planned to have you or Jim work, but as neither of you seem to be hankerin' after a Back to the Soil job we might as well make that finance this here scheme of yours. But the first thing is to get this job and learn the business then as you are goin' along we'll plan the future."

As a matter of fact the Old Boy was Cookoo with joy. The other children had rather looked down on father's crude and coarse ways and now to have this one, his favorite, come and want to go in business with him was almost more than he could stand, but he was just grim enough to make the boy earn his spurs and believed that that was the only way to tell whether he was really in earnest and had in him the stuff that spells success.

"You're a Brick, dad," said Willie. "Watch my Exhaust. You never saw me work cause I never had anything to work for but my own amusement. Watch me show Up some of these Wise Bobolinks that have an idea they can Peddle accessories. You might as well put a mortgage on that 160 acres or, if you want to sell it, I'll find a buyer during my spare time and turn my commission into the venture. Keep the Deal Under your Hat and I'll report my progress on the job as soon as I make some. How big a Pile of Jack do you think you ought to get for that quarter section?"

Old Kooms was skeptical about Willie's ability, but as Willie put up a good Spiel and one of his men was in poor health and away on an extended leave, he decided to try Willie out at the liberal salary of \$12 a week "to start" plus 5 per cent on his sales. He figured that Willie wouldn't do much but would be around to help out when there was a rush; the commission sounded big but Wouldn't Mean Anything as Willie wouldn't make many sales.

Before Willie had been around a week, however, Kooms took a Reef in his estimates of Willie, for Willie was Blowing 'Em all Down and was Walking Off with pretty nearly all the business that came in the place.

At first the other salesmen were amused and let him go to it, knowing that if he didn't make sales he wouldn't get much salary, but when he got to cutting in on their sales so strongly that it showed, they began to get worried and suggested to him that he use a little discretion.

"What do you Birds care," said Willie.
"You're on a salary and besides business is business and I'm here to Clean Up all I can. I need the money. The old man thought he was getting me for nothing

an' I gotta prove he was wrong even if it hurts your feelings."

From that point Willie's picking wasn't quite so Easy. They were all up on their hind legs to get their share and Willie found it more up hill. They put obstacles in his way, gave him Bum Stears wehenver he asked about the stock and dropped Monkey Wrenches in his Machinery at every opportunity.

There was one of them called Frank that Willie particularly liked because while he wasn't a particularly good salesman he was sincere and honest and a decent sort of chap. He knew the stock better than any of the rest and when Willie got a customer that stumped him he promptly turned him over to Frank. This tickled Frank, as the rest of the Bunch had always walked on him and he was quick to return the favor and give Willie all the tips and help that he could.

As a result of this alliance, Willie's sales held up pretty well while Frank's just about doubled. He was the happiest Guy in the County and acquiring more pep every day. He watched Willie's smoke and while he could never hope to attain Willie's easy convincing manner, he was able to improve his own greatly especially in the way of appearing interested in the customer's wants and anxious to please him.

Beside Frank, Willie wormed his way into the stock keeper's affections. He did this mainly by treating him like a human being but emphasized the treatment with a good story now and then and a judicious use of cigars.

What Frank didn't know about accessories the stockkeeper did and it wasn't long before Willie knew almost as much as both of them and consequently, more than either. He knew all the articles, when they sold, which sold best, what



was a fair stock, what things to avoid stocking and how long to hold goods before sacrificing on the bargain table.

Every time Willie saw his Dad he was more enthusiastic over the accessory business and had more ideas for his new store. After his first week while he was reporting his progress, he said: "I'm not Slipping Myself any Bouquets, but those Goofs over there are certainly a Poor lot of Fish and I think I can sell Rings around th whole Bunch, from the Old Man down. His Jiglets has about as many ideas as a Dodo. He takes the business that comes to him if it ain't too much trouble and his salesmen sit around and wait for the customers to come in and wake them up. When I've been busy I've seen A No. 1 prospects come in, give the Dump and the stock the Once Over all by themselves and go out without investing a cent while a couple of 175-lb. salesmen were trying to decide why Babe Ruth fell by the Wayside in the Home Run Race. Any one of them had rather settle World Problems with one of his pals than give his brain a Workout convincing a customer that it was false economy to put an old tube in a new case."

As the season came to a close, the Old Man began to prepare to Crawl into his Hole till spring, but instead of Canning Willie he decided to hang onto him and made a proposition for the following year which was calculated to Land him hard. But Willie didn't swallow the Bait, Hook and all as he was expected to do, but said that his plans were incomplete and he couldn't give his answer till a little later, probably along towards the first of the year; just at present he thought of taking up something that would give his abilities more scope.

As a matter of fact Willie wanted to make a circuit of the Big Towns to look over some of the jobbers and incidentally to see some really up-to-date accessory stores. He would have plenty of time to do this before starting to plan the new place and he needed all the ideas he could find.

Kooms was glad to have him stay as long as he would, so he hung around till about Christmas, then started on his circuit to be gone a month, ending up at the Chicago show.

Upon his return he was crazy to get to building, but here the Dad put in his Oar and counseled Caution.

"You may know all about Accessories and Salesrooms," he said. "But your ideas have all come while looking out from the Inside." Your customers will all look in from the outside and before they look in they got to have something to make them turn their head and come close enough. Gyp concerns do it with Fire Sale signs and Yellow Paint, but stable, conservative business likes a more high-class method. When you get your rough floor plans to suit you, take them to Campbell, the Architect, over Cincinapolis and tell him to whip them into shape behind a front that a motorist can't help seeing at least a half mile No gingerbread or expensive chocolate frosting, but hold and Hit 'Em in the eye Stuff. The motoring public travels about 30 miles an hour past here and once past it never comes back. If



a man can see your place and realize it is an accessory store half a mile away, that only gives him 60 seconds to decide what to do and lots of Yaps need more time than that to decide they're alive."

As usual Dad was right, so Willie got to work on his sketches. Primed with all the knowledge he had picked up at the Kooms store and on his recent trip, he made quick work of it and was shortly placing his plans and data before Campbell.

That gentleman, thrilled by the request for something bold and unusual, put all his designers at work on the job, making it a sort of competition with a prize for the one accepted. Needless to say, the result was wonderful and Willie had to take the sketches home to father before he could decide.

Between them they chose a very rugged looking structure of almost black cinder brick trimmed with square terra cotta blocks of ivory and brilliant turquois blue. It could be seen a mile on a cloudy day and would make the most disinterested observer Sit Up and Take Notice.

In the meantime floor plans and working details were completed and Willie was off to let the contract and get construction under way.

The building was not large but had a long frontage on the highway with a really commodious modern filling station set partly into it. There was a sort of tower at either end which gave it dignity. The rest of the building was but one story but was built two stories in front to make a Big Splash on the horizon, to display the checkers and give some large panels for signs.

When it was about Finished. Willie

"Sufferin' Cats, Dad, She's a said: Cyclone. The bird that tries to drive past here without stepping on the brakes will take an awful risk. When the touring season Breaks Out and develops a Temperature, jobbers will have to ship us Repeat Orders by special fast freight. With a Come-On like this, I predict that next season your modest quarters back there will do an Aesop Bullfrog and instead of the wrench and wheel-puller, you will Wield a Wicked Inspection on the work of others. Don't be a Quitter, the stuff is going to be here and you've got to handle it. On my trip I saw hundred-car shops operated by Goofs that weren't One Two Three to you. It's lots easier to steer others than do it yourself even though sometimes the work's not done quite so well."

As the season progressed there became no doubt that the venture was a Howling Success. People would stop to buy gas just to get an Eyeful, but would seldom get away without a Tilt with the Cash Register. Willie or one of his well trained Understudies was always on the job to Jolly the customer while the Pump man pulled his Tank and if anyone shied a remark about the Swell Layout, it was Willie's Cue to take them on a Personally Conducted Tour. Courteous treatment and prompt, careful attention were the watchwords and they certainly Paid Dividends.

The Old Man had more men working for him in the shop than there was room for, so that he had to Lay Off the Greasehound Act and function as Willie had predicted.

Moral—First you have to stop 'em and then you can Shake 'em Down.

sh ell

np

aid

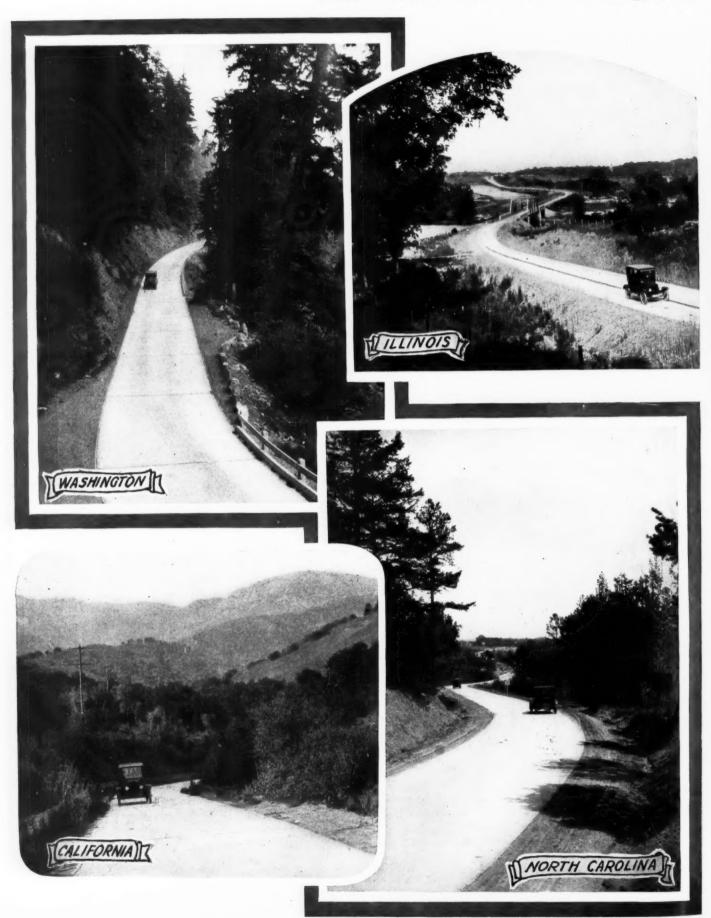
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SUMMER TOURING

Now is the Season of the Call of the Open Road when man is consumed by a desire to see what lies beyond the mountain. When Grandpa was a boy and his vagabond nature broke out he shouldered his bamboo rod and tramped to the nearest stream or lake to trick the finny dweller from its depths, but now our Modern Vagabond loads his family and his friends into his faithful motor car and is off for hundreds maybe thousands of miles of adventure. Now is the time when all good dealers prepare to cash in on this Age Old Wanderlust, with plans for special service and special accessories to suit this trade

Good Roads Promote Touring and



Touring Promotes Better Business



Touring is a nightmare without good roads. The better the roads are the more enjoyable the trip. Compare, for instance, the two pictures to the right; during the war Uncle Sam's trucks were obliged to plow through, but no sane tourist would think of risking his car or his disposition on such a trip. Now, however, with a clean, smooth concrete ribbon, watch the cars whiz past

The other pictures on these pages show how trunk highways from Maine to Washington are being made permanent with concrete

Every garageman and dealer in the land should get behind the good roads movement either personally or through his local or state association. There is no one industry that is more benefited by improved roads than ours and the least we can do is boost and boost hard

If your state can't afford concrete it can at least improve its highways by drainage and the judicious use of grading and gravel, and laying out a comprehensive system connecting all the large towns. When this is accomplished the concrete will come as fast as the improved business will make it wanted

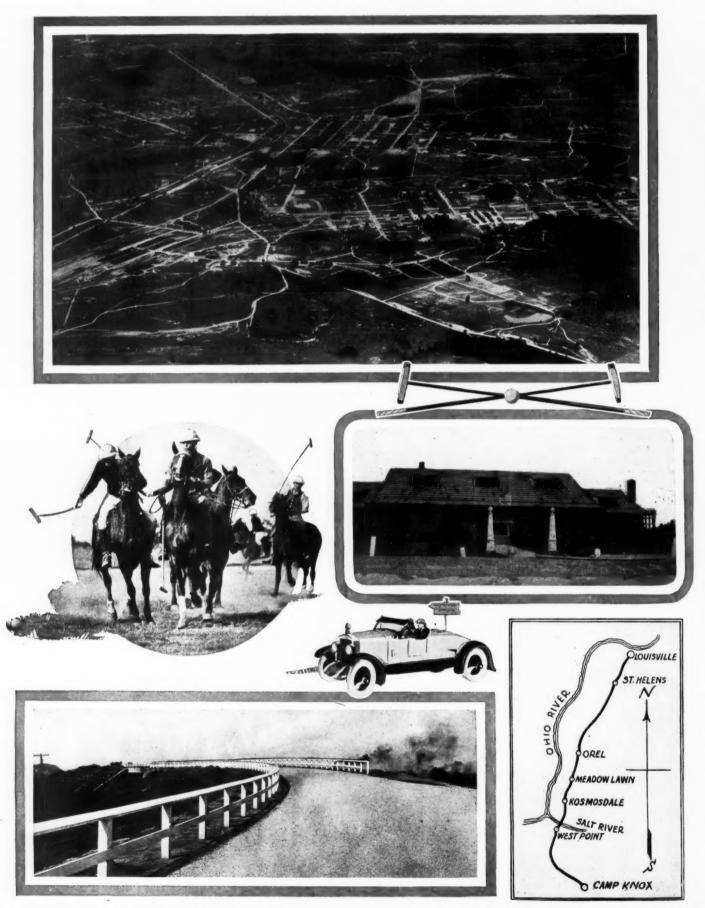
Many of the roads shown here are through communities which could not possibly support a road except for the benefits derived by the rest of the commonwealth but they bring the four corners of their respective states together in a way that benefits all

Boost good roads and good roads will boost you. If you can't get concrete get the next best thing, a little maintenance and a little gravel will do wonders



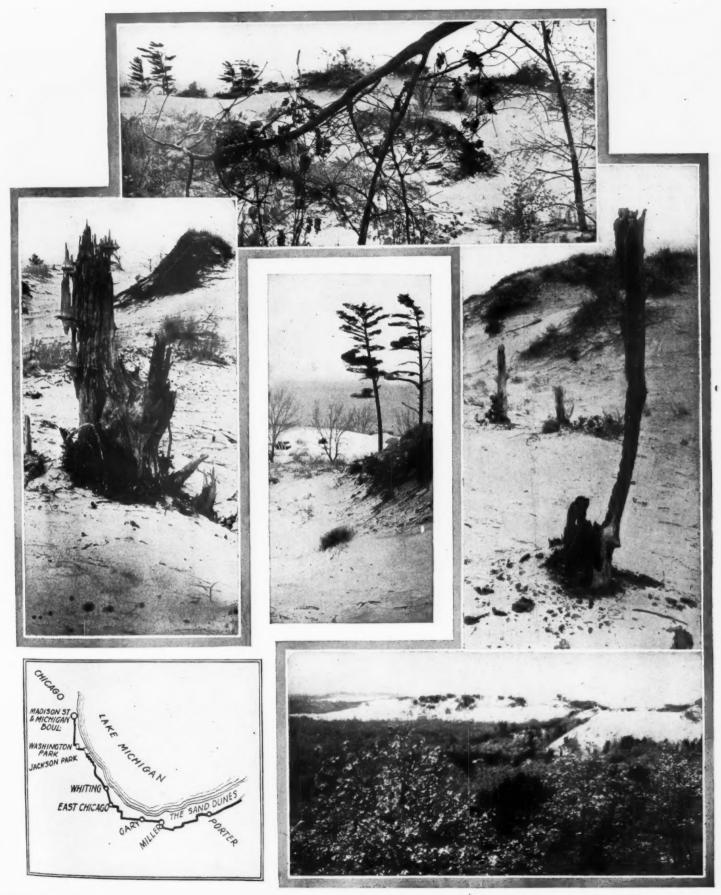


Call the Tourist's Attention to Local Beauty Spots



Surely every dealer has within a radius of a hundred miles or so of his business some interesting spot noted for its scenic beauty or history. Maybe it's an army camp, the dwelling of a famous writer, a battlefield, a famous waterfall, the sand dunes of Indiana or a summer

a Small Map Will Help Him and Will Help You

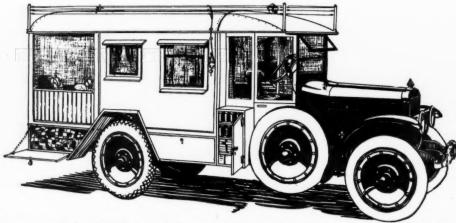


resort in Montana. Small road maps showing the towns and interesting points might easily be made up and distributed by the dealer. Suggestions for such maps are shown on these pages. A little advertising matter on the back of the maps will give your business a boost

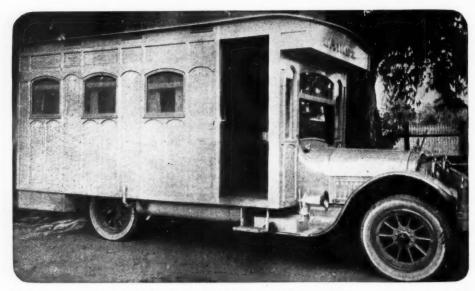
Here Is the Answer to



An Austrian nobleman, Franz Van Schlechtleitner, unable to make a living in his own country has started on a tour of Europe in this candy-store truck. It is designed after a picturesque Tyrolese house and has combined the comforts of home with a candy kitchen and salesroom



People pay \$75 and \$100 a month for one room apartments in the city and live like ants—here is a one room apartment that can be taken anywhere—look it over. Is it worth \$75 a month to know what happens in the woods at night?



The man who assembled this job, did it when coal bills threatened to make winter an unpleasant thing. He packed up a few things, fitted out the car with all that was needed and went south while his less fortunate friends had to struggle along as best they could at home

Something new, something new, always people want something new. In automobiles, there has always been plenty of new things for the American people to satisfy this craving for individuality. Every day, inventors and manufacturers broadcast announcements of new fitments for the car, adding to the grace, comfort and convenience of the great transportation unit, the automobile

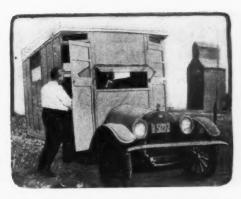
With a motor car, people have found something with which they can return to the more or less primitive. The day in the woods in the car is always the best day of the week. On these pages is shown something new—the American home on wheels, the comforts of modern inventive genius have penetrated the lair of the gypsy and the home of the Indian



"The Call of the Wild"



This is the other side of the car shown on the opposite page. Note how conveniently the radio, a bed, table, stove, cabinets for dishes and tools and bed clothing have been put into this traveling home



Suppose you got a toothache when you were out on a long trip, far away from those who could take care of it?—Just send a call by radio to Dr. T. W. Caldwell, dentist of Saskatchevan who has converted his car into a traveling dental parlor and he'll dash right over and yank it out

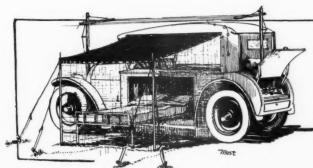
The radio and motor car, one breaking the ties to the dwelling in the city and the other bringing to the ears of the rover, the "goings-on" at home. Something new?—it's here, always new, for, though we are slaves of progress, progress indeed treats her slaves well

"For the health of the American citizen!" might well be the slogan of the manufacturers of the automobile. And to the dealer who sells them is this distinction, he is as great a factor in the making of good citizen as is the school, for is not the automobile the means by which the youngsters see the actual picture of what they study?

And, could we peer into the future—50, 100 years from now, what will they bring?

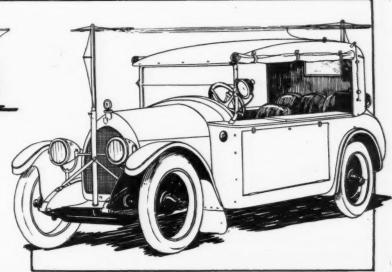


The war showed this man what he was missing if he didn't have his feet in mud some of the time so when he got home, he packed it up in this truck and beat it for the open. (It appears, however, that he was careful to see that his face didn't get into the mud)

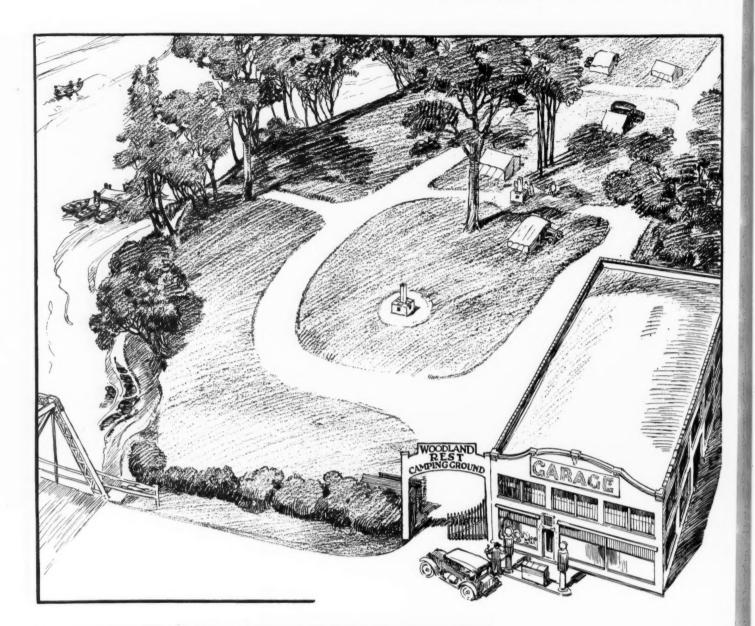


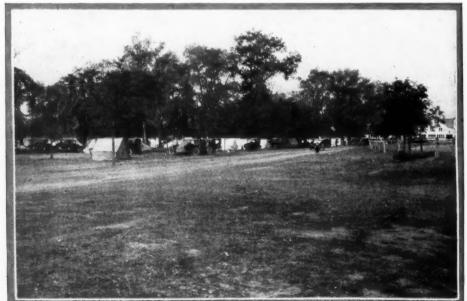
And this is something else again. Here is shown the car with the bed and tent drawn out for a night's rest on the road. Note the compartment in the rear for necessities and the radio equipment

Here is the same car, ready for another jog through the country. Comfort while riding has been provided for the same as when the occupants stop to sleep. The receiving set of the radio outfit is handy so that a concert can be enjoyed while riding



Take an Interest in the Tourist





Making the motor car tourist comfortable has become a fine art in some communities and cannot be recommended too highly. It makes the tourist safe for the night and keeps him from squatting where he is not wanted. It gives the camp promoter an opportunity to cash in on his trade while it helps the tourist to mix with his fellows and exchange road and service information.

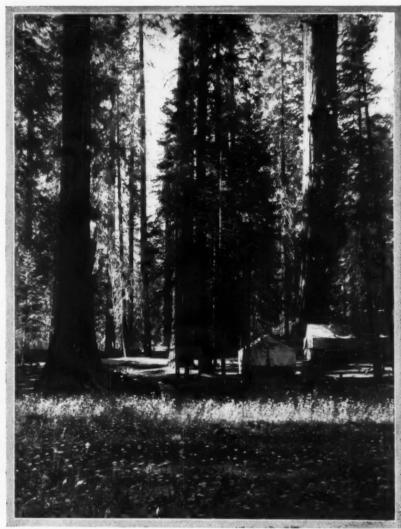
Above is a Motor Age conception of a garage controlled camping sight located just outside a town on the bank of a lake or river.

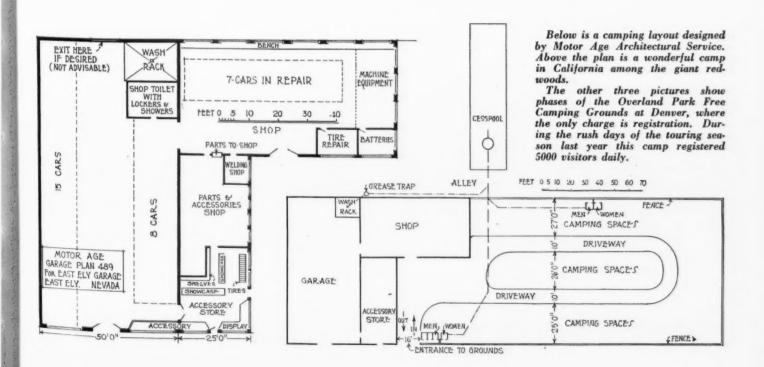
Why not get a list of the camp sites with in a day's run of your place so that you can give tourists all the details? Or, better still, if you are located right, start a camp of your own.

and He Will Spend With You

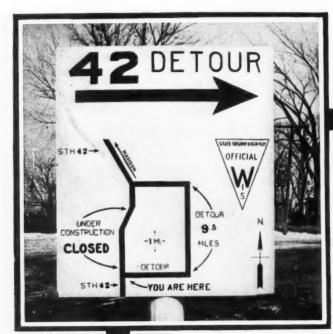








Wisconsin Makes It Easy for the Tourist









"It's harder to get lost in Wisconsin than it is to find the way in many states." This slogan sounds like braggadocio, but the motorist who has toured in Wisconsin will tell you that it is true and that for money expended the Badger state has more good touring roads than any other state in the U.S.

While many states and highway associations use elaborate danger signs in profusion when the danger is slight, thus making the motorist calloused to their warnings, Wisconsin signs are simple and direct and waste no paint in needless flourishes.

In another state we have seen a long easy S curve that could have been taken at 100 miles per hour marked with a 4 ft. danger sign accentuated with skull and cross bones. Not so in Wisconsin; while their system has always been the best, the signs indicated on this page will, this year, replace all other older types and even further tend toward simplicity.

The detour sign which gives the tourist an idea of where he is bound for is in itself a masterpiece. Then, too, the commissioners capitalize by placing a huge map of Wisconsin at the state line on every trunk line entering the state. It shows the tourist where he is and if he has a mind he can there and then pick his route across the state.

Every state in the Union could study the Wisconsin system to advantage and garagemen's and motor dealer associations should not rest until their states have a well mapped out program of highway improvement and proper marking. There is nothing like proper markings to make the traveling public good tempered and in a generous state of mind.

Another service is the supplying of large wall maps to garagemen giving up-to-date information of roads under construction and detours marked in red ink.











The Department of Agriculture Aids the Automobile Dealer



The United States Department of Agriculture has recognized the lure of touring to create a sentiment in favor of national playgrounds, such as Forest Preserves and National Parks. To that end the Government displayed recently the exhibit shown here, at the Denver Automobile Show. Thus there is being created by the Department of Agriculture new and extensive markets for the merchandise of the motor car dealer. The more attention paid to National Parks and Forest Preserves the more the public will flock to them and the one big means of transportation is the motor car. More parks—more motor cars. And, more motor cars means more sales for dealers





Let the Tourist Know You're Working



Aid the Motor Traveler to Find His Way



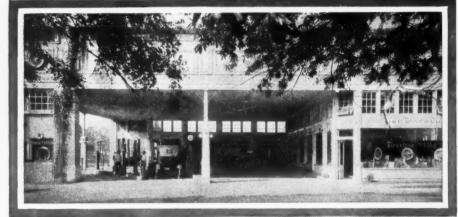
permit but by introducing a boost for him-self on every sign the expense can be charged to advertising and will surely come back many fold if the job is done right

The mistake many men make in this line is to lead the tourist up to the town and then leave him to find his way from there un-aided. If the town authorities will not per-mit one to run the signs up to his very door a few brief directions near the town limits will often do. Such for instance as, Turn left at 6th St. one block, or similar phrase that anyone can remember

A large sign of the same general character as the other signs on the shop or in front of it will usually put the whole system over and hook the signs up with the shop they
are intended to advertise

Avoid long phrases that the tourist cannot read going 30 miles an hour and also mixed up words that must be disciphered. Straight forward, simple phrases are best

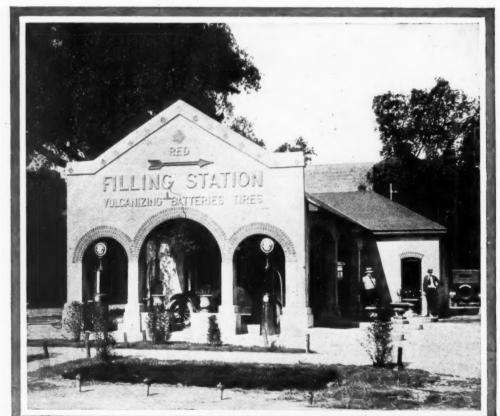
Make Your Place of Business Inviting If You Would











Just because a dealer might be situated in a small town is no reason why his place of business cannot be attractive. In fact, it should be easier to make the small place of business attractive than a larger one. A freshly painted gasoline pump at the curb is more likely to attract attention from tourists than is one which has a dull appearance.. An orderly show window, clean windows and a building void of meaningless signs is far better bait with which to catch the eye of a passing tourist than dirt and disorder

Get Your Share of the Tourist Business This Year





Notice on these pages how well kept some of our small town places are. On the other hand, notice the one ill-appearing place which attempts to handle a perfectly good make of car. Go across the street from your place of business and look it over before the tourists get a chance. You may want to make some changes





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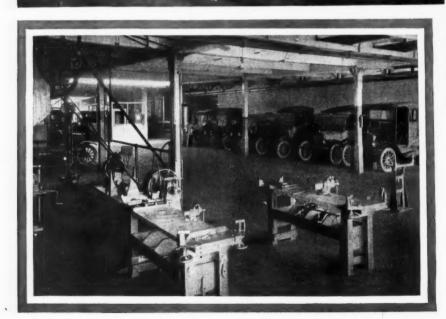
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Make the Shop a Tourist Haven









If you are on a touring route, tune up and tool up to satisfy this trade. A welding outfit and electric drill are among the most necessary pieces of special equipment for quick repairs

Neat well ordered shops are essential and clean, comfortable waiting rooms are quite important. Waiting rooms like the upper picture where accessories are displayed are quite a means of profit. Often a customer will spend many times the cost of a puncture repair on a means of profit. Often a customer will spend many times the cost of a puncture repair on some needed tool or accessory. Not one repair man in a hundred cashes in on this idea although tire repairs make up a good percentage of the tourists troubles and the tire shop should carry a good line of general accessories and tools

A Shop and Sales Opportunity

Will You Grasp It?

There's a smell o' things a growin'
Apple blossoms scent the air
An' the brook is overflowin'
Life is bubbln' ever'where.

For the great outdoors is callin'
An' the motor cars respond
New or old, they're sweetly singin'
Bound for wood an' lake an' pond.

In a certain town there was once a fellow known for miles as the most shiftless man in those parts. His greatest failing, for which he was most roundly berated, was in allowing his roof to go unrepaired for many a year, in spite of the fact that it leaked badly. Wagging tongues failed to disturb his habitual calm.

Finally, one of the townspeople, more inquisitive than the rest, stopped the shiftless one on the street one day and asked just why it was that, with so much leisure time, he never fixed the roof.

"Wall, yer see," said the shiftless one, "It's about this-a-way: when the sun's a shinin' it don't need fixin' an' when its rainin' ther pesky thing's too durn slippery."

He had evidently never born the brunt of an assault from an up-to-the-minute roofing salesman.

Many a car owner is in the same frame of mind. When he decides on a trip, he may start out with little thought as to what he may need. If his local dealer is asleep, he buys little, for on starting he needs little. When he is stuck on the road for a tube, or jack, a spare bulb or a can of oil, he must necessarily do without, patch up as best he can and limp to the next town.

He loses in motor car satisfaction and the sleepy dealer in



uite

"When the suns a shinin' it don't need fixin', an' when its rainin' ther pesky thing's too durn slippery"



Hide the Supplies; It Saves Reordering

his town joins in the loss. A sale of supplies has blown through the open door.

On one of the much traveled roads leading out of Chicago, there is a gasoline pump. Fifty feet from the pump is the cross-roads store. A hundred feet farther away is a barn in which a supply of automobile accessories are kept. The son of the storekeeper works the pump.

"Do you ever ask the drivers of cars at the gas tank to buy supplies?" the son was asked.

"Oh, no," was the answer, "They might get sore. Anyhow," he continued, "If they need anything, they will ask for it."

There are many of us that feel this way. The little boy who wants to earn a rifle by selling ten packages of bluing, says: "You don't want any bluing, do you?" And we agree with him and say, "No, not today." A lesson could be learned from the sideshow barker at the circus. He has nothing to sell, makes a lot of noise about, and makes sales anyhow. A small portion of his crust would combine well with the legitimate line of supplies that the dealer has, to give the car user those things he really needs.

Is the automotive dealer less intelligent than the clerk in a department store? No, but he is often a mechanic first and a merchant last or not at all. The clerk from whom you buy a shirt will do his best to also sell you collars and ties, but the automotive dealer is not usually awake to such opportunities. The possibilities here are not mere theory. They work. In a certain Ford service station, the sale of a tire means that the salesman will come out to the counter, bringing not only the change, but a new tube as well, pulling it out of the box with the remark, "Wouldn't it be a good idea to put a new tube in that casing? The old tube may give out most any time."

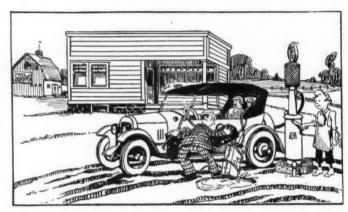
The extra sale is not always made, but is, occasionally. It

makes an extra jingle in the cash register and is worth the effort of getting out the tube and putting it back. If the salesman can muster up just as genial a smile when the answer is "No" as when the reverse is the case, he will also never have the sad experience of making the customer sore, as the boy at the gas pump would put it.

The Easy Selling Season

When the car owner begins to look over his road maps, it is time for the dealer to get out his spring merchandise and put it where it can be seen by everyone coming into his place of business. The touring season is the easy selling season for vacation money is being spent, and the motorist knows that if there is any time when he does not want to be caught short on supplies, it is when he is on a trip.

About the best salesman you have is your show case. Make it work, for it talks without boldness and never forgets its story. In one small town, a tire dealer had a fine show case,



"I never ask 'em to buy. They might get sore"

right at the door, but the story it told was a sad one. Instead of having an array of attractive merchandise, it was dirty and full of junk. A cardboard full of holes, where lamp bulbs once had been; a fan belt, some tube boxes from which the tubes had been taken; a pile of miscellaneous spark plugs and some other rubbish made up the display. The owner of the shop was asked why the show case was such a mess and he replied, 'It's pretty hard to keep it looking nice when you are taking things out all the time."

This was a lazy man's alibi, but if that man would realize the money he loses by such carelessness, he would mend his ways. In one way he was right, for it is hard to keep pulling things out of a case and still keep goods well arranged. The answer to that is, to use the case for show purposes, not as a stock room. For large numbers of spark plugs, for example, a shelf in the stock room should be used. One or two in the show case is a sufficient number to show that plugs are for sale.

Small signs in the show case also help to present the value of the goods on display. A can of tire dough on display may tell its story to the waiting customer, but if a small card is placed behind it saying, "Repair a ten cent cut and save ten dollars' worth of tire," its display will certainly be more effective. Other items for sale also have a definite appeal which will sell goods if intelligently expressed.

The incident recounted where the gasoline pump was at the edge of the road while the supplies were hidden in the barn, gives an illustration of a chance to use a show case to advantage. Back from the pump a small shelter could be put up and in it a small show case could be used. Samples from the larger stock in the barn could be used in the case and they would tell their story while the pump was being worked. Then, if the pump operator is on the job, he can suggest items that the car needs from his observation as he "fills her up."

To the dealer in the car owner's home town, there are numerous opportunities presented for selling automotive merchandise. The Ford Motor Co. recognizes an opportunity of this nature in putting up an emergency package, containing two spark plugs, also a head lamp bulb and one for the tail light.

How to Sell

Many dealers in automotive merchandise do not know how to approach the subject of the car owner's needs without being too blunt about it. The habit of conversing with the customer about the weather, politics, the foreign affairs, or most anything, is a good habit to form. It infers a measure of acquaintanceship and leads up to other topics from the subject of the car and its needs is the next step. Conversation about the weather, while often condemned, is nevertheless useful.

In wet weather, the condition of the roads is a natural conversational topic. This leads us to the use of skid chains and the clay roads throughout the country can be used as a sales lever, for the argument for safety is a legitimate one and the cost of chains does not compare with the cost of a smash-up or even the cost of being pulled out of the ditch. To sell chains to a man bound on a trip across country is doing a favor, not asking one. The tow line also comes in the same class, and is available under a variety of circumstances.

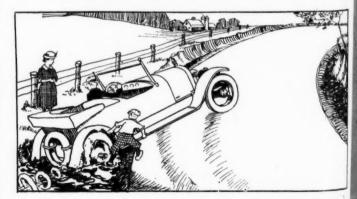
Along with the question of country roads, the matter of roadside tire repairs comes naturally. This brings up the spare tire question and the advisability of carrying two tires, to insure freedom from delays and inconvenience on the route. If the prospect does not care to get an extra casing, he is probably a good prospect for the sale of some emergency tire material. Tube patches, blowout patches, and tire plasters for reinforcing fabric breaks and preventing tube pinching are the logical materials to show.

With these items, the long handle type of jack can be mentioned as especially adaptable for use on a muddy road, and while the customer will not usually fall in line with all the suggestions presented, he is likely to remember some sad occurrence where one or more of the items offered would have been worth many times its cost. If this is the case, there is no question about the sale. Then, while the recollection of a dirty job is fresh in the prospect's mind, show him a can of soap that cleans without the use of water. You will sell that, too.

In any event, you are sure to sell more goods by judicious presentation of your product than if you wait for the customer to ask for each item.

Luggage carriers are always in order for spring and summer business, and with the sale of an article of this nature, a little discussion about driving can be made to bring out the relative features of day time and night driving. If the customer drives at night, he may be in need of new lenses or reflectors, or for headlights that are most effective in lighting the road without producing a glare that annoys the approaching driver. The pocket flashlight is also a handy item for the tourist, whether he drives by day or night, for its use is not limited to the car but can be used to advantage at the roadside camp.

For the long trip across country, there are many things that for the short run might be considered extras, but on the long drive become essentials. One of these is the canteen designed to carry a spare supply of gasoline, oil and water. For the customer who does not wish the canteen, the handy oil package makes a partial substitute and gives assurance for the



A discussion of the weather and the roads naturally leads to the sale of a number of things

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long runs across barren wastes, or wooden tracts where supply stations are many miles apart.

Nor do the sales of equipment have to be limited to absolute necessities, for the car owner bound for distant parts wants comfort and convenience, together with assurance that he is headed in the right direction. Here the road map and the route book combine with the speedometer in guiding the motorist across the country. Many a man needs these touring helps and frequently speedometers or speedometer parts are also in demand.

My Town

While at home the average citizen will prove to be a knocker of everything in town from the way his neighbor dumps the ashes in the alley to the way the minister ties his tie. When away, however, the story is different; there is no place like home and the average individual is proud of his home town and wants folks to know where he comes from. Interest is also added to the trip when at a local camp the cars are seen from all over the country and their home ports noted. Pennants and metal plates on the different cars serve to supply this added interest to the touring season, and few tourists there are that will fail to take interest in a pennant or town plate for their car.

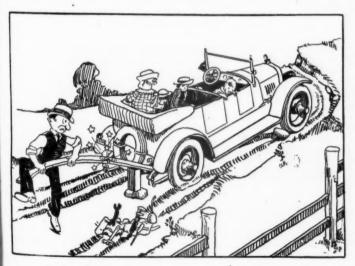
Just to Keep Cool

The touring season is generally synonomous with the summer season and the pleasure of a trip is often measured by the driving comfort available. Closed and open cars alike have a general tendency for the engine heat to make the front compartment unduly hot, so that at this time the cowl ventilator should be welcomed by the prospective tourist. Then, if the dealer's line branches out a bit to include some of those things that supplement the car's equipment, he may present the vacuum bottle as a luxury well nigh approaching classification as a necessity.

Nor is it the occupants of the car alone that face the necessity of keeping cool. While a certain amount of heating is desirable in the engine, there still is a limit to all things, and overheating is the limit in this case. Here, a radiator thermometer is the logical piece of equipment that the car should have, so that on a long run across country the temperature condition of the engine may be under the observation of the driver.

And in the Shop

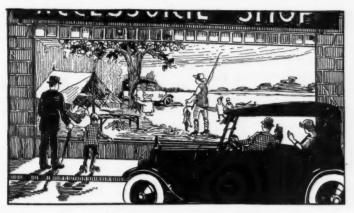
Not at the accessory counter alone does the touring season present a round of profitable opportunities, for the service salesman selling oil or gas has a chance to sell both labor



He has the long handle. Puzzle, where's the jack?

and material. Many of the useful auxiliaries to promote motoring satisfaction require installation. A power tire pump, for example, most appreciated for that roadside tire job, needs installing at the maintenance department.

Shock absorbers also fit in the touring schedule, and for maximum gasoline economy, an adjustment of the carbureter



Oh, boy, let's go. Let's see, what will we need

will prove of benefit to the car owner. Carbureters are universally set too rich, and this is especially true after the winter season, where ease of starting has been the prime consideration.

The accessory salesman's campaign for safety in driving may be supplemented by the talk of the service salesman. If the conversation leads to roads and hills, it also leads to brakes, and nine times out of ten the car brakes are not in the best of condition and need adjustment, at least, and probably new linings as well. Safety includes, naturally, the use of a good warning signal, and here both the sale and installation of a new horn gives another sales possibility.

And the passing tourist, what does he mean to you? Is he an unfortunate victim of circumstance when he has a blowout when near your place, and do you soak him for all he is worth, thinking you will never see him again? If so, you are taking an indirect blow at your own future. If, on the other hand, the tourist is a favored guest in your shop and in all maintenance stations where he may stop, the beneficial results will be beyond calculation.

Your shop rule should be, "The tourist first." He represents the great car owning public and on his favorable report the future prosperity of the whole automotive business depends.

By the Camp Fire

A picture tells a story. The story gives a vision and when the vision comes to life it leads to action. To the car owner, having in mind a hazy idea of a camping expedition, a show window dressed to depict a camping scene serves to crystalize

Make your window tell a story. Put a small tent in one corner. Take some electric light bulbs and cover them with red tissue paper and a few branches and a log to represent a camp fire. Over the fire have a camp stove of some sort, with a frying pan and coffee pot ready for action. By the tent a fish rod, a landing net and frog bucket. Before the fire have a table, set with camp dishes, a camp chair or two; then, in the rest of the window, show the seasonable accessories previously mentioned, and you will find folks going by but stopping for at least a glance before they pass.

A number of things are accomplished by a window display of this character. If the dealer does not figure on many actual sales of camping equipment, he can buy just enough to trim his window and sell from a catalog, taking the commission due to him. In this way he makes in two ways, first by the sale of the supplies for wood and stream, and second, by the sale of automobile accessories to the customers who drop in on account of the display. Without an attractive window, the accessory trade might go elsewhere. Where larger business of this nature is anticipated, it is well to put in a small stock of camp stoves, tents, or other supplies that sell well at this season of the year.

One method of handling camping equipment and thereby promoting the use of motor cars is found in cooperation with sporting goods dealers. In some territories, arrangements have been made whereby tents and other pieces of equipment have been lent to automotive dealers for display purposes. The accessory store is then also provided with a catalog and a commission is allowed on any sporting goods sold.

Even if there would be no profit on camping equipment itself, it would be worth the effort, for the impulse it would give to outdoor activities and the use of automobiles. Now and then a car owner will be found who may mention a desire to go on a trip but may feel that even the expense of a camping equipment is more than he can afford. If this is the case, the dealer may present to his customer the possibility of getting many of the things he needs from the stores throughout the country which are handling surplus army supplies, for at such places good equipment can usually be found at very reasonable prices.

As to Stock

A story is told of a cross roads store near a summer resort. The story includes a young woman as any successful story must, and the plot develops in connection with a beach party at which a marshmellow roast was scheduled. The girl in the story dropped in at the store one day and interrupted a game of checkers with an inquiry as to the possibility of getting the needed marshmellows.

The veteran of the checker board paused in his play long enough to say, "We don't keep 'em no more, sold so many we couldn't keep the dum things in stock."

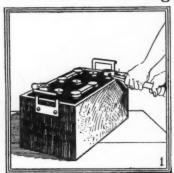
Don't be like the checker fiend or you will have time on your hands and nothing else. Order in time so you will not have to say to every other customer, "No, we are just out of 'em.



"We don't keep 'em no more, sold so many we couldn't keep 'em in stock"

Build up your spring business by having on hand an adequate stock of these things you know go well in the spring. Then put them where they can be seen, believe in your goods and your customers will believe with you.

Why Batteries Don't Need to Go Wrong



WHEN we published an article in the January 11th issue of Motor Age in regard to the use of tools for removing battery terminals we thought we had slipped over quite a clever idea on our subscribers. We woke up to find that a new terminal has been devised which does not require special tools.

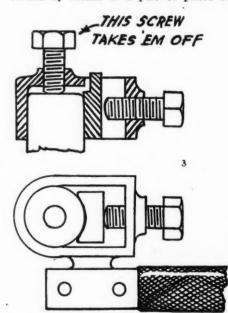
We have all been accustomed to the



gear puller and wheel puller idea but up to the present no one has had sense enough to apply it to a battery terminal. Such, however, is the Spack terminal made by the Curtisville Battery Terminal Co., Curtisville, Ind., and while we have spent a day or two looking at a sample and trying to find something wrong with it we have so far failed.

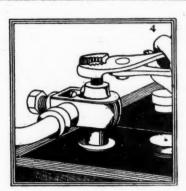
Fig. 1 shows the old fashioned method of taking the terminal off where the

ordinary terminal is used and no special tools are available. In this way you are just as likely to get the post and a piece of the plate along with the terminal as not. In Fig. 2 is shown a general view of the Spack battery terminal and in Fig. 3 is shown a sectional view and a view from underneath. Fig. 4 shows how the upper screw can be turned by means of a pair of pliers to



pull the terminal off of the post.

As the reaction of this upper screw is entirely against the post there is no possibility of damaging the battery. The upper portion of Fig. 3 shows the terminal in sections. In this illustration the screw at the right has been backed off so as to loosen the clamping action on the terminal. Operation of the upper screw will now lift the terminal. In the lower view of Fig. 3 the screw at the right is represented as being tightened up and the small metal piece against which it operates is shown clamping the terminal post.



The movable piece operated by the clamping screw is cleverly designed so that it cannot fall out of place unless the clamping screw is backed nearly all the way out. At the same time this clamping piece is capable of setting at most any angle so as to securely hold either a tapered or straight post.

TO PREVENT CHATTERING VALVE SEATS

Many mechanics have found some difficulty in the use of reamers because of the fact that in their use they have chattered the valve seat. This is probably due to the fact that the reamers have considerable clearance to prolong their life from a cutting standpoint. After some experimenting, Albertson & Comakers of the Sioux line of tools, have devised a method whereby the novice can ream a valve seat without chattering it

It requires merely the use of a slip of paper about 2½ in. square. Before reaming, the paper is inserted on the pilot stem between the reamer and valve seat. The first few turns of the reamer will cut through the paper and form it around the valve seat. The reamer will the take hold of the metal and cut a smooth even seat. Ordinary wrapping paper will do the trick, although the papers prepared by Albertson & Co. are printed with a series of concentric circles to indicate the various types of valves seats for the various sizes of reamers.

Selling the Spirit of the Wanderlust

When the Dealer Promotes Touring, He Promotes the Sale of Accessories, Tires, Maintenance and New Cars. Some Suggestions on How to Do It

By JAMES V. MALONE

OW many of the car owners in your community are, as you read this, planning a trip or series of trips this year when they get their vacations? What will it mean to you when they set out on their excursions? Whether it means anything to you or not, we do not know, but this much we do know: The proper cultivation by you of the desire for touring is going to lead to many accessory, tire and maintenance sales and, if you're a live wire, it should also mean the sale of some new cars.

If you "bust right into it" NOW and boost summer touring, you're going to profit in a most gratifying manner. It's all right for these folk to be "planning" trips now, but do they ever materialize? Do they ever get so far as to say, "Well, now we'll run over to Blank's service station and have the car fitted out for the trip"? Do they figure you in on the "expenses" which they put into such

If they don't, then it's your fault. And it's your fault, too, if, when the time comes for the party to leave on their tour, they find something to take its place. Every Saturday should be the day when you will wave good-bye to a customer who is off on a week-end trip to some nearby point of interest and the following Monday should witness him, happy and smiling, getting back to work feeling as if he had put in two days living his life as he ought to.

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And vacation time for each family is again a time when you should get busy and do a little waving, but there are other things to be done before you can say. "Good-bye, have a good time," and one of them is to sell the customer on the idea of touring as often as possible because, as pointed out, the more the car is used the more accessories, tires, gas, oil and eventually new cars will be sold.

Picture to the car owner, through ads and letters, the beauty of places that they can visit on week-end and extended tours. Tell them of the conveniences offered by places along the way, of the hotel accommodations, restaurants and the like. Sell them a complete service for their car.

How to Go About Selling the Touring Idea

As stated above, many folk do a lot of planning in the spring, but when the time actually arrives, there is likely to be something that will throw one of the well-known monkey wrenches in the works. There is the kitchen to be painted or the roof to be repaired or a new chicken coop to be built. Your job is to sell folk on the idea that their health and happiness comes first.

Have you gazed on naked grandeur where there's nothing else to gaze on,

Set pieces and drop curtain scenes galore, Big mountains heaved to heaven, which the blinding sunsets blazon,

Black canyons where the rapids rip and

Have you swept the visioned valley with the green stream streaking through it, Searched the vastness for a something you have lost?

Have you wandered in the wilderness, the sage-brush desolation,
The bunch-grass levels where the cattle

Have you whistled bits of ragtime at the end of all creation,

And learned to know the desert's little ways?

Have you camped upon the foothills, have you galloped o'er the ranges, Have you roamed the arid sun-lands

through and through? Have you chummed up with the mesa? Do you know it's moods and changes? Then listen to the wild, it's calling you.

—Service

Free Maps and Road Information

On any trip you desire to make in your car this year, whether it is for a day, a week or a month. If you own an automobile, we shall be glad to supply you with any data you may need to complete any trip to any part of the country.

Our TOURING INFORMATION SERVICE is supplied with all of the information on free camping grounds, hotel accommodations.

SERVICE is supplied with all of the information on free camping grounds, hotel accommodations, routes, road conditions, and, in fact, everything to aid you in getting out into the open with your car and "seeing America."

Come over and talk to us about any trip you are contemplating. We shall be glad to supply you with anything that you need.

"A ride a day will keep ill-health away."

away."
THE RUNWELL SALES CO.

Dr. Max Thorek, Chicago physician, is one of the staunchest advocates of the "Many of the people who come to me," he says, "are not sick at all. They work too hard and too steadily, never give a thought to play and as a result their mentality and physique become slow sluggish things. In these cases, I simply say. 'Get into your car and take a long drive into the woods, stay away from everything for a week or two and see what happens.' It is not at all surprising to me when they return feeling 'fit as a fiddle' but their statement to me always is, 'Believe me, I'll make better use of that car from now

Right here to begin with, you have the recommendation of a doctor and we know that anyone who follows Dr. Thorek's advice will agree with him that the automobile is the best tonic in the world. What's the use of living if you don't own a car, and worse, if you DO own one and just use it to swing around nearby places in?

Sell the owner on the motor car as the ideal means of vacation transportation. For sight-seeing, ease, comfort and privacy, it stands as the peer of all vehicles.

One Suggestion for the Promotion of Touring

Organize a touring club among the car owners of your territory. There are many ways of doing this: You can make the program large or small, according to the time you put into it and the money you want to get out of it. You might co-operate with the other members of your trade association or with the local chamber of commerce or business men's association.

Put your sales force to work selling memberships in the club. Let the salesmen act as pathfinders, going out and laying out over-Sunday tours. The admission charge and dues to cover any trouble that owners may experience on their trips. Send one or two salesmen with each excursion and a repairman and tow-truck. Have a course laid out and have some definite destination in mind.

Pay the salesmen a commission on each member that they bring in. People will like this sort of thing if it is handled without too much commercialism in it. The dues can be made large or small, according to the things it will cover. If you decide to get together with

"The Greatest Tonic in the World"

That is what a prominent doctor has said of the motor car. If you own one, "A ride a day will keep ill-health away." Come over and get our FREE INFORMATION ON TOURS TO ALL PARTS OF THE COUNTRY.

COUNTRY.

Our TOURING INFORMATION
SERVICE has maps and data on
tours to every place of interest you
can think of. Whether you are going for a day, a week, or a month,
it will pay you to talk to us about
it.

It.

Try a ride in your car into the "great outdoors" for what alls you. If you want to know of a quiet nook on a trout stream, we will tell you how to get to it. DRIVE OVER NOW.

"A ride a day will keep ill-health away."

away."
THE RUNWELL SALES CO.

some other dealer or the trade association, have a complete understanding with them as to what each will do.

Perhaps you would furnish the repairman and pathfinder one Sunday, someone else the next and so on. This is a suggestion to you, you know whether you can put it over or not. Maybe the conditions in your territory are favorable to such a thing. If they are, we believe that with the proper supervision and management, the idea can be made into something worth while.

Whether you decide to organize a touring club or not, get yourself posted on the automobile camping parks that are within a day or half a day from your town, know the location of all the places where people may stop for provisions and have the information at hand for all who apply. Two books which give this information are The Official Camping and Camp Site Manual of the American Automobile Assn., New York, and the Tourists' Camp Ground Directory of the United States Touring Information Bureau, Waterloo, Iowa. These books cost about 50 cents each.

Is There an Outdoorsman's Club in Your Town?

Still another avenue to the promotion of touring is through the local sportsmen's club if there is one. Get in touch with the officials of such a club and tell them how you are equipped to supply members with their motoring needs. If it is worth while, arrange to send a truck with any excursions that they may make.

Other clubs and organizations undoubtedly exist in your territory and they are

First Letter

Dear Mr. Blank:

It used to be that "April showers brought forth May flowers," but now it seems to me that they bring forth a desire in folk to get out into the great outdoors and do the things that we read about in books. You have read of the exploits of the men who live in the woods and open spaces and know that you have envied them, just as I have.

You know of the things that are going on in the forests at this time of the year, how everything is slowly coming to life, the birds wandering back to their summer homes and the leaves bulging through the tiny shell of the bud. You know that that desire you experience to get out and break every tie to the monotonous existence of every-day life is just Nature's way of bringing you back to life.

Your hand is itching for the feel of a fishing rod and isn't there a great satisfaction in knowing that you no longer have to look to books to get a breath of the atmosphere that makes real men? Before you owned an automobile, you could but envy the men who did, or those who could go away and see and know things.

Now you have your own car, the greatest asset to health that you can have. It is the means whereby you can go as the gypsy goes, follow the endless trails back to the life you have heretofore only read about and longed for. We send you this letter to remind you that in your car you have the one great means of recreation that every man needs-may you have many good times in it this summer. Very sincerely yours,

Your Car, a Camera and an Open Road

And an Open Road

Hitting the trail to Nature's Wonderlands was never easier than now, if you own an automobile. There isn't a man who hasn't wished that he could go and live the life of the characters of Jack London's and James Oliver Curwood's stories.

With an automobile, you can do it. The far corners of the country are but a few days away and our FREE TOURING INFORMATION SERVICE will tell you how the roads are for any trip you want to make. Free camping grounds, hotels, beauty spots along the way, everything is recorded on the maps which you can have by calling on us.

Whether you plan a trip for a week, a month, or a day, we can help you. Drive over NOW and talk it over with us. We shall be glad to tell you anything about any of the tours you want to make.

"A ride a day will keep ill-health away."

away."
THE RUNWELL SALES CO.

good prospects for the touring salesman. Arrange trips for the members of the local business men's association, church societies and the like and get people to come away from the hum-drum existence of every-day life, even if it is only for a

You might begin to get the touring trade in your town by circularizing all of the owners and clubs NOW and keeping after them. Here are some suggestions for letters and ads in which you may find some ideas that you can use in promoting this greatest of all outdoor sports, automobile touring.

On the first page of this article are two ads, first and second, respectively, of a campaign that we suggest; on this page are two letters and the third appears at the top of this column and the fourth at the bottom. Perhaps the suggestions contained in these will at least set you on the right track.

Prepare one, two, three or four extended trips to points of interest at a distance. Select, say, some national park in the west, or some famous resort and get the information on the roads, hotels, camping grounds, restaurants, service stations and things of interest along the way. Feature one of these trips at a time with a letter and an ad or two.

When You Feel the Itch for Rod and Reel-

Don't hesitate. Grab the old tackle, jump into your car and drive over to us. We have the very latest and most complete information on tours of all kinds. We know where the game fish abounds and shall be glad to give you maps and road data on how to get to a quiet nook where a big catch is certain.

Talk to us about any trip you contemplate as we have all of the information on road conditions, camping grounds, hotels and places of interest along the way. You can Have This Service without Charge.

"A ride a day will keep ill-best?"

A ride a day will keep ill-health away."
THE RUNWELL SALES CO.

Second Letter

Dear Mr. Blank:

The other day I got into my car and took a long ride out the —— Highway and I can't resist telling you of the wonders that I encountered. Believe me, I didn't feel much like coming back, with all of the beauty that surrounded me, luring me to go farther and I was thinking of the good times that folk will have during the summer months out in that great play-

I even found a stream gushing over the rocks, clear and cool, and I know that there's going to be some trout there in the open season and I'm going back. Really, never felt so good in all my life as when I stepped out of my car and romped over the hills and gulches—I stayed long after the hour I had set to return because every minute that I spent there made me feel

just 100 per cent better.

I was thinking what a prominent doctor has said about the motor car, "the greatest tonic on earth," and I wondered why he had said it, because it IS competition for medicine. It is a thousand times better than anything you can take for any illness.

I want you to run over and see me before long and get the "dope" on some nice trips that you can take this summer in your car. I have maps and information which I shall be glad to give to you—I want you to know that your automobile is the best thing you have in the world.
Sincerely yours,

Have on hand all of the information on places nearby where folks can go over the week-end or holiday trips. Boost holiday excursions, advertise some place that an owner can drive to in a day, see some things and return in time for work the following morning.

Know the rivers and lakes nearby where fish abound, tell people of the scenic gems that surround them, tell them to take their cameras along and shoot pictures on the way that they can have for the cold nights during the winter to look back on and to keep as permanent reminders of another trip. Once people "get the bug," they will not be held back by anything—they will want to go and keep going all the time. For the sportsman, have him make his automobile his best friend, a closer companion, even, than his dog. The more you boost the touring idea, the more you will profit.

When you get information of places along the way, get the names of the good merchants, not those who will "gyp" your customers but the ones who are there to serve them honestly and at a fair price. They will remember this and go to you for all of their information and incidentally, their tires, accessories, repairs, gas and oil and for folks who do not own the car you sell, you will find them friends and prospects.

Often, bits of verse will prove effective when used either in the letter or in the ad. The two shown on these pages will give you an idea of what you might use, should you care to stir up the spirit of the wanderlust with poetry. The bit printed on the first page is from Robert W. Service's "The Call of the Wild" and the one on the last page is from Kipling's "The Feet of the Young Men."

There are many beautiful poems which

Third Letter

Dear Mr. Blank:

Here it is, May 15 and everything is set for a wonderful summer. What are you going to do with your Saturdays and Sundays and with your vacation? Have you made any plans for them? Surely, you are going to go somewhere in your carthis year—you want to get your money's worth out of it and you will if you will let it be your physical director.

There are many places right close by where you can go and get a complete change of scenery, breathe air that is laden with the perfume of wild flowers and hear strange birds and see their pretty colors as they flit from tree to tree overhead.

You know that it is going to do you and your family a world of good to get out as often as possible and romp in the open—you will be better able to wrestle with business during the week and you will have the pleasure of seeing the kiddies having a good time.

Let us tell you of the many enjoyable trips that you can take over Sunday. We have a complete touring service with maps and road information which we will be glad to give to you, WITHOUT CHARGE. We want you to get full value from your car and we know that one of its many uses is in bringing health and happiness to its owner.

Very sincerely yours,

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describe beautiful places that might be used to start the "bug" working in the mind of the car owner. Or, a glowing word description and a photograph, will do the work. When writing ads which are to sell the spirit of the gypsy, remember that that is all you are selling. Do not try to work in something about

the notation that they can get a map for a visit there by applying at your garage. Mail the cards from the place when you visit it.

The ads and letters shown on these pages may contain some suggestions for you in approaching the owner on the

Now the four-way lodge is opened, now the hunting winds are loose—

Now the smokes of spring go up to clear the brain:

Now the young men's hearts are troubled for the whisper of the trues, Now the red gods make their medicine again.

Who has seen the beaver busied? Who has watched the black-tail mating? Who has lain alone to hear the wild-goose cry?

Who has worked the chosen waters where the ouananiche is waiting, Or the sea trout's jumping crazy for the

Who has smelt wood-smoke at twilight?
Who has heard the birch-log burning?
Who is quick to read the noises of the night?

Let him follow with the others, for the young men's feet are turning
To the camps of proved desire and known delicht

-Kipling

your shop or car unless it be a casual reminder.

Another way to sell the touring idea would be to send out postcards to all your owners showing some place of interest that you have visited. On the re-

Fourth Letter

Dear Mr. Blank:

We have not yet had the pleasure of seeing you at our touring information department which we installed this year to aid car owners in planning their summer tours. In this department, you will find a complete line of maps and road information. We shall be glad to answer any questions concerning any trip you want to make or give you any map that you may want.

If we have not got the map or information that you need, it will not take us long to get it for you. What we are interested in is in seeing you get the very utmost in transportation from your car and you know that as a means of vacation and outing transportation, it is unsurpassable.

It is always ready to answer the call of the road, to take you from the surroundings of every-day life into the always new, always changing outdoors. If you feel out of sorts or a bit tired when you come home at night, don't begin to think that you are going to have a "sick spell." A ride into the forest, away from everything for even a day will make a big difference in you.

Drive over and let us tell you of the places you can visit where you will find your old "pep" and feel as if you had "tasted of the fountain of youth."

Very truly yours,

verse side of the card, a few words describing the beauty of the place and then subject. But you will have to keep after them. The one thing to remember is that when you set out to sell the spirit of the wanderlust, you must sell the automobile as the chief aid to the owner's health, recreation and happiness.

Effect of Oversize Tires on Steering. A Correction

In the December 28th issue on page 16 there appeared comment by Mr. Harold W. Slauson, Kelly-Springfield Tire Co., commenting on effect of oversize tires on steering. It is apparent from Slauson's statement that he did not carefully read the paragraphs in question and they are herewith reprinted.

"The sales engineer of a prominent steering gear manufacturer recently stated that cord tires were responsible for more shimmying of the front wheels than any other single factor. His explanation is based on the fact that cord tires are considerably larger in all dimensions than fabric tires of the same rim size. Especially is this true of that dimension of the tire measured across its diameter.

"On a few cars the stub or spindle is so designed that for a certain chosen tire diameter the center of road contact of the tire will coincide with the center of the king pin axis when projected. Increasing the diameter of the tire serves to place the king pin axis outside the point of contact of the tire on the roadbed. The effect is clearly shown by reference to the illustration at Fig. 17.

"When the point of tire contact with the road and the king pin bolt axis coincide there is practically no turning moment about the king pin axis. Increasing the diameter of the tire creates a couple or turning moment equal in value to the horizontal distance between the point of road contact of the tire and the king pin axis. The wheels, passing over an uneven roadbed, impart alternate compression and tension through the steering cross bar or connecting rod which in turn, sets up a series of oscillations of the road wheels which are imparted to the hand wheel, and the result is shimmying.

"However, on most American cars, the king pin axis, with the regular tire equipment does not coincide with the center of road contact of the tire, but almost with the inner edge of the tire. Most king pins on front axles of American make have their axis slanted inward towards the starting crank of the engine, and in that case the installation of an oversize tire would tend to bring the axis in line with the center of road contact of the tire, unless, of course, the tire was more than two oversizes larger than the original tire for which the spindle was designed."

Slauson states that the article calls attention to the possible effect on the steering by the substitution of a cord tire for one of the fabric type of the same nominal size. In no portion of the manuscript is this statement made, although considerable is said to the con-

trary. Attention is directed to the last paragraph of the reprint particularly the sentence as follows:

"Most king pins on front axles of American make have their axis slanted inward towards the starting crank of the engine, and in that case the installation of an oversize tire would tend to bring the axis in line with the center of road contact of the tire, unless, of course, the tire was more than two oversizes larger than the original tire for which the spindle was designed."

We would again refer Slauson to the caption under Fig. 17 which depicts the effect of fitting oversizes tires rather than the effect of fitting cord tires where fabric tires were formerly used. I believe that if these paragraphs are reread by Mr. Slauson he will note the manuscript is the author's version of the effect of tire sizes on steering and a contradiction of the theory of the "Sales Engineer."

TIRE COMPANY CHANGES HANDS

CLEVELAND, March 31—The Hubbell Tire and Rubber Co., at Newton Falls, O., has been purchased from the Trumbull Tire & Rubber Co. by a syndicate of Clevelanders headed by R. J. Shindler. Operations will be started by the new owners on April 2 under the name of Newton Falls Rubber Co.

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THE CLASS JOURNAL COMPANY

Horace M. Swetland, President W. I. Ralph, Vice-President E. M. Corey, Treasurer

A. B. Swetland, General Manager David Beecroft, Directing Editor

Mallers Building, 59 East Madison Street, Chicago

BUSINESS DEPARTMENT E. E. Haight, Manager

EDITORIAL

Clyde Jennings, Editor B. M. Ikert, Technical Editor

DETROIT OFFICE Edward Schipper

WASHINGTON OFFICE 26 Jackson Place, N. W.

BRANCH OFFICES

New York City—U. P. C. Building, 239 West 39th St., Phone Bryant 8760
Detroit—317 Fort Street, West, Phone Main 1351
Cleveland—536-540 Guardian Bldg., Phone Main 6432
Philadelphia—1420-1422 Widener Bldg., Phone Locust 5189
Indianapolis—1212 Merchants Bank Bldg. Ph. Circle 8426
Boston—185 Devonshire Street, Phone Congress 4336

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The Summer Service Number

HE thought in this number of Motor Age is not a new one entirely, but we do not recall any previous effort to so directly and emphatically connect touring with the promotion of automotive sales. It is the thought of the editors of Motor Age that in the main the full meaning of touring to the industry has been overlooked. Too many men in the automotive business have, to an extent, at least, looked upon the tourist as a nuisance, some one to be gouged and preyed upon.

This practice and tendency we believe to be a serious error; as we see in the growing practice of summer vacations in motor cars the greatest hope of this industry for a stability of growth of the use of cars, the steady growth of road improvement and the development of better equipped and superintended shops.

There is no question that the maintenance department of this greatest of all industries will not entirely right itself until it admits that the car owner is boss. At the same time, we might as well admit that the car owner is the boss of this country. He forms the greatest body of voters with a single purpose. He and the people who ride in his vehicle supply the balance of power in all elections and he and his friends can vote in or out of office

any individual or party on whom he centers his attention. The hope of the development of the highways of this country rests with the car owner. There is insidious propaganda going the rounds against the truck and touring car owner, and all that is necessary is for the automotive dealer to pass the right word along to the owners of this country and the promoters of this propaganda are whipped. Take Iowa, for instance, where they are threatening to tax the trucks off of the public roads. If this is done, it means that the trucks will build highways of their own, rent surplus capacity to car owners, and Iowa will remain the victim of its bottomless roads, just as it is today. And yet Iowa has an army of car owners which is proportionately one of the strongest in the country, and the dealers of that state owe it to themselves to organize this body by proper encouragement, both by political advice and by proper treatment in the maintenance establishments. Wisconsin is a shining example of a state that is deliberately encouraging tourists and reaping a harvest thereby. Ask any wide-awake Wisconsin maintenance

In this number of Motor Age we are making another distinction that we hope is obvious. In this number, SERVICE is regarded as something the automotive dealer owes to his customers, the same sort of service that any merchant owes to customers. MAINTENANCE is something the dealer has to sell. He owes his customers good work and certain service; such as information, rest rooms and courtesy.

Just one more point about this number: This is broadly an application of "Ask 'em to buy" and "Shop Profits" campaigns carried on by the Merchandising Department of the Automotive Equipment Association. Ray Sherman was not original in his fundamentals in this campaign, but he was original in his application, especially as to the energy with which he applied it. Sherman is now engaged in other work, but this movement is going forward under the direction of Aet Mogge. We merely acknowledge our debt to this movement in asking the dealers of the country to ask their car owners to tour, to tour properly, and to buy adequately of the things that are necessary for pleasant, economical and safe touring.

How does the front of your building look to the motoring public?

Why a Tire Price Spread?

CORRESPONDENT who sells a great many tires in the course of the year expresses considerable satisfaction at reading the recent editorial in Motor Age on the subject of tire price spread of 300 per cent in tires of the same size and general specifications.

Our correspondent evidently is more of a student of tire conditions than many tire dealers and he says that he has had this unwarranted spread of prices in mind for some time and that over a considerable period he has watched the top of the list to see why some tires were so very high

This man has reached the conclusion that the high prices are due to high guarantees. He says that where these high priced tires cannot be sold otherwise, that a very high guaranteed mileage is made the basis of the price. The idea being to sell a man one tire and then supply him with enough replacement tires to give him the mileage. This idea, of course, is based on the theory that the car owner will finally get tired of changing, will move away, go on

a tour and have a blowout or some other incident of this kind which will bar him from collecting his entire mileage from the dealer who sold him the tire.

This is a different theory from that generally held. The usual idea is that this very high retail price put on a tire is to permit heavy discounts to those customers who like to buy at a "special price" and to enable the dealer to gyp the customer who will buy without making a very strong price resistance.

The dealer's explanation of this high pricing of some tires is worthy of serious consideration. Any way you think of it and whatever explanation is made, one cannot help but think:

Some people have queer ideas of merchandising!

R 1 3

Five minutes of sales conversation may bring more profit than hours of shop labor.

28 X %

Associations and Touring

THE broad subject of promoting touring is one that very well indeed lends itself to association work. There should be a well worn path between the automobile owner or touring club and the dealer association. The two can do much good for car owners and the industry if they will take each other into their confidence.

The dealer association members know much that will be of benefit to the touring club. Today, almost every automobile club has as one of its objectives the directing of its members and tourists to shops where good service can be obtained. The car dealers of the community should supervise this activity to an extent, at least. If they do not want this trade for their own shops, they should make certain that the shops recommended are worth while and that they turn out good work.

The Illinois Automobile Trade Association has made an arrangement whereby the members of the State Association will be recommended by the Illinois State Automobile Association as proper maintenance shops and garages. This is a step in the right direction and shows what can be accomplished.

Also, the dealers well know, or should, what are worth while owner clubs in the country, and they should warn their owners against the fake institutions. Just now there are a lot of mushroom touring protective services springing up over the country and most of them are fakes. The same is true with most of the so-called "national" clubs.

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Every car owner is a prospective buyer of equipment.

28 28 ER

Truck Information

T has been said many times that the reason the salesmen failed to sell trucks was that they did not know enough about the uses of trucks and did not keep abreast of the development in truck haulage. This is undoubtedly a proper and a justified criticism and many times truck salesmen have asked how they could

keep informed on such a progressive business as truck hauling.

Automotive dealer publications have felt the call for such information, but they have been unable to supply it in sufficient volume, as it was entirely too big a job. Truck development is a wonderful subject all in itself and to keep abreast of this development would require a special publication. The time has come when we are willing to make a direct suggestion to the ambitious truck dealer or salesman. It is this:

That he become a reader of Motor Transport, a publication which is quite abreast of the times on the truck use and related subjects; such as motor bus development, automotive vehicle fleets of all kinds. In fact, this is a publication devoted to automotive mass transportation.

It is not published for the truck dealer, but dealers can here find the sales message that will enable them to talk truck use and maintenance with the large and small users of trucks.

N 1 36

Often the establishment of a real accessory department means the difference between sub-normal and satisfactory profits.

28 28 88

Tax Targets

POR several years the automotive vehicle has been holding a place in the limelight as a tax target and there is an increasing evidence that this light is to get brighter as the days proceed. A part of this sentiment is due to the politicians and jobholders who are merely looking over the field for activities that will justify their salaries. Another part of it is due to active minds that are not properly directed into useful activities.

Recently, the health commissioner in Chicago put 20 inspectors on the streets to detect the smoking automobiles and to drag their owners into court as enemies of the health of the community. This form of activity is probably more due to a desire to keep 20 men on the payroll than anything else. Not long ago these same 20 men were being stationed around the city to make notes of automobile horn noise. This in the city where there are elevated railroads, flat wheel street cars and smoking factory chimneys!

Only recently a weekly newspaper that enjoys much of its prosperity from automotive advertising has come out emphatically in favor of licensing all drivers of motor cars. The writer of the editorial probably was honest in his advocacy of such a restrictive measure, but he does not understand the situation.

The politicians are suggesting this as a revenue measure. Such a plan means work for political henchmen and more money to spend by those in power. Where licensing is in vogue, everybody gets a license if he has the price. Besides, who is going to enforce it? To stop the drivers of the 12,500,000 vehicles and examine the licenses every day would require a terrific army of jobholders. It might be best to wait until the Volstead law enforcers are through with their work before such a job is undertaken. The first thing the theorists know, they will have to draw all the wage earners out of the automotive factories to enforce the automobile laws. Then they will have killed the goose that laid the golden egg.

Some Prices Higher, Some Lower

3 Dort Enclosed Models Reduced in New Revision

Increases of From \$5 to \$35 Made on Four Open Models— Sports Lowered

FLINT, Mich., April 2—The Dort Motor Car Co. has announced a revision in prices affecting both the four- and six-cylinder models.

On the four-cylinder chassis the regular roadster and phaeton have been increased \$5 and \$20, respectively, while the sport roadster and phaeton have been decreased \$35 and \$20 and the Harvard sedan is listed at \$20 less.

On the six-cylinder chassis similar changes are effective. The roadster and phaeton are increased \$20 and \$35, respectively, and the Harvard coupe and sedan are reduced \$10 and \$30.

The following are the old and new prices:

Four-Cylinder Models

		01	ld price	New	price
2-pass.	roadster		865	\$	870
5-pass.	phaeton		865		885
2-pass.	sport ro	adster	1,015		980
5-pass.	sport t	ouring	1,015		995
2-pass.	coupe .	***********	1.020	. 1,	,020
2-pass.	coupe, I	Iarvard	1,145	1.	,145
5-pass.	sedan		1,070	1.	,070
5-pass.	sedan, F	Tarvard	1,370	1,	,350
	Six-6	ylinder	Models		

	SIX	-Cylinder	models	
		O	ld price	New price
2-pass.	roadst	er	990	\$1,010
5-pass.	phaeto	n	990	1,025
2-pass.	coupe		1,145	1,145
2-pass.	coupe,	Harvard	1,365	1,355
5-pass.	sedan	*************	1,195	1,195
5-nass	sedan.	Harvard	1.495	1.465

UNCLE SAM TRACTORS REDUCED

MENASHA, Wis., March 31—Considerable reductions in the price of the "Uncle Sam" tractors have been announced by the U. S. Tractor & Machinery Co., the manufacturers. The following are the new prices, the reductions ranging from \$245 to \$450:

	(Old	Price	New	Price
C-20	12-20	\$1	235	\$	990
B-19	20-30	1	985	1	535
D-21	20-30	1	895	1	485

COLUMBIA INCREASES SOME MODELS

DETROIT, April 2—The Columbia Motor Car Co. has added a new phaeton to sell at \$1095 and has increased prices from \$40 to \$70 on some models. The coupe has been increased from \$1235 to \$1295, the sedan from \$1395 to \$1465, the phaeton from \$1095 to \$1135. The price of the standard four-passenger phaeton remains at \$985.

COLE AD MANAGER RESIGNS

INDIANAPOLIS, March 31—Frank A Parill, advertising manager of Cole Motor Co., who has been identified with Cole advertising for about a year, has resigned from the company. He is not yet ready to make announcement of his future plans.

KALAMAZOO TRUCKS INCREASED

KALAMAZOO, March 31—Another increase in the price of their trucks has been made by the Kalamazoo Motors Corporation. While three of their models remain unchanged, the new prices vary from \$390 higher on the 1-ton delivery model to \$50 higher on the 5-ton truck. On Dec. 11, 1922, all Kalamazoo products were advanced, the increases ranging then from \$155 to \$300. The following are the old and the new prices:

	Old Price	New Pric
T 1-ton	\$1295	\$1685
G1 1½-ton	2100	2100
LC 2-ton	2645	2775
DH 3-ton	3350	3350
HD 3-ton	3350	3500
SK 4-ton	4000	4000
CK 5-ton	4500	4550

STANDARD TRUCKS HIGHER

DETROIT, March 31—The Standard Motor Truck Co. has announced an advance in the prices of its trucks. All models have been increased from \$95 to \$495 with the exception of the 1¼-ton delivery truck which remains unchanged at \$1330. The following is the new price schedule, which becomes effective immediately.

O	ld Price	New Price
75 1½-ton	\$1330	\$1330
1½K 1½-ton	1600	1695
2½ K 2½-ton	2400	2795
31/2 K 31/2-ton	3150	3645
5K 5-ton	4400	4495

SUNBEAM REDUCED \$3500

NEW YORK, March 31—British Sunbeam Motors announces a substantial reduction in American prices, the biggest cut coming on the limousine-landaulet, which is dropped \$3500. The old and new prices are:

		C	na price	New price
5-pass.	phaeton	\$	9,500	\$7.000
7-pass.	phaeton	*********	9.950	7.500
Limous	ine-landa	ulet	12,500	9,000

Block of Willys-Overland Stock Not to Be Sold Now

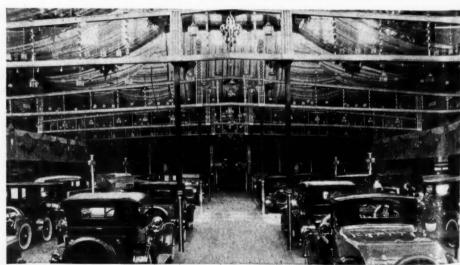
Court Denies Application of Willys Corporation Receiver to Dispose of Huge Holdings

NEW YORK, March 31-John N. Willys, for the second time within a year, has scored against banking interests, which, it is claimed, sought to wrest from him control of the Willys-Overland Co. This victory was achieved through the decision by Judge A. N. Hand of the Federal court, who denied the application of the merchandising and banking creditors of the Willys Corp. to confer upon Receiver Francis G. Caffey authority to sell 739,866 shares of the common stock of the Willys-Overland Co., representing part of the assets of the Willys Corp. The decision was without prejudice and may be renewed after sixty days.

It was a court battle between the creditors and New York banking interests on one side, seeking to have the stock sold, and Willys-Overland and Ohio bankers on the other striving to block the effort because of the menace to control of Willys-Overland. The stock held by the Willys Corp. constitutes about one-third of the total and while its possession does not now carry with it control of the Toledo company, yet it would after the back dividends on preferred stock have been paid.

Willys' counsel and his Ohio bankers painted a bright picture of the present Willys-Overland situation. They declared the company is making \$1,000,000 a month and expects to maintain this pace for the rest of the year. Commitments call for the production of 20,000 cars a month in April, May and June.

View of Boston Show



The Boston show, held March 10-17, was responsible for a good start made by members of the Boston dealers' association

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300,000 Production in March

Private Service Stations Do Big Business: Beecroft

Editor Gives Amazing Figures to Advertising Men at Detroit

DETROIT, March 31—An amazing volume of business is done annually in private service stations, according to figures presented by David Beecroft, directing editor of the Class Journal publications and general manager of Motor Transport Magazine, at a luncheon held here today. Before eighty prominent manufacturers and advertising men, Beecroft gave some surprising figures as a result of investigations conducted among 15,000 private service stations in this country and abroad.

The statistics were based on figures available from upward of 4000 replies to a questionnaire. Probably the most outstanding fact disclosed by the investigation was that 85 per cent of fleet operators using more than three vehicles maintain their own service station. These service stations carry their own stocks of parts, machine tool equipment and supplies to a degree varying with the number of vehicles operated, but to a surprising extent even down to as low as three vehicles.

Accompanying the figures on the number of private service stations were interesting reasons as to why these were employed rather than public garages. The answers brought out the importance which fleet owners attach to the ability, with a private service station, of keeping the vehicles running at all times. The entire research brought out very clearly the fact that the truck itself is only a tool and that the organization behind the truck is a far more important factor in the earning power of the transportation business than the truck itself. Another point brought out and which was of considerable interest to those present was the fact that the fundamental problems of transportation are the same regardless of the business in which the transportation unit is used, and also, regardless of whether passengers or freight are carried.

While the analysis as made so far does not give any definite figures as to the actual buying power of this hitherto unexplored section of the industry, it is sufficient to indicate that it far exceeds any casual estimate. When it is considered that more than 85 per cent of the fleet owners operate their own garages and with fleets running up as high as 4000 and more vehicles, an extraordinary market for machine tool equipment, parts and supplies of all types is disclosed. Beecroft urged a closer contact of the manufacturer with these organizations servicing their own vehicles as the most profitable and satisfactory method of meeting the major problems of the motor truck industry.

NEW BODY PLANT

DETROIT, March 30—Contract has been let for the erection of the new Fisher Body Corp. plant at Pontiac, which will make bodies for the Oakland Motor Car Co. division of General Motors Corp. It is expected to complete the new plant in 90 days. The plant will cost about \$2,000,000.

Illinois Trade Association
Has Official Systematizer

PEORIA, Ill., March 31-Frank Brunninga, a certified public accountant of this city, has been engaged by the Illinois Automotive Trade Association as the official systematizer and accountant of the association. The plan is to make a special rate for Brunninga's services for the automotive dealers belonging to the Illinois association, and he will recommend to them methods of bookkeeping and practice that will enable the dealers to compare notes on profits and to render the right kind of statements to banks and others interested. This service has just been announced by F. C. Zillman, general manager of the association.

Bureau Denies Story on "Saturation"

WASHINGTON, March 31—Denial was made by officials of the Bureau of Public Roads here that they had sponsored a news story to the effect that the saturation point would be reached in the automobile industry within two years.

It was stated that the Bureau has no idea as to a definite time for saturation. The discussion as to the latest registration figures in various states was misinterpreted, the Federal officials explained.

Automobile Excise Taxes Show Tremendous Increase

WASHINGTON, March 31—Excise tax receipts from the automobile industry for February showed a tremendous increase as compared with last year. The income from these sources nearly doubled. The taxes from automobiles and trucks amounted to \$710,017.58; other automobiles and motorcycles, \$5,886,852.09; automobile accessories and parts, \$3,476,269.73. The figures for February, 1922, were: Automobiles and trucks, \$396,809.98; other automobile and motorcycles, \$2,606,408.82; automobile accessories and parts, \$2,385,356.04.

COMPANY RENTS BUICKS

BIRMINGHAM, Ala., April 2—The Drive-A-Buick Co., F. S. Farland and J. B. Webb, operators, has been started in Birmingham. The firm rents new Buick cars to persons wishing to "drive-it-themselves." The cost is said to be very little more than a Ford would cost for the same purpose.

Output Establishes Record; Schedules Higher for April

Unprecedented Forward Movement of Industry Continues With Demand Unabated

NEW YORK, April 2—Reports from all branches of the automotive industry for March indicate an unprecedented forward movement, continuing in a marked degree the improvement that was noted in February. With a new output record established last month in the volume of cars and trucks, major automobile manufacturers are continuing operations along March levels, and, in instances, increasing them.

During the early part of March, car and truck manufacturers operated on schedules approximately 17 per cent greater than those followed through the previous month, turning out a total in excess of 300,000. June of last year, with its 289,011 output, most closely approached last month's figures and up to this time set the highest production figure for any month. Estimating March production at 300,000, the total output for the first quarter will aggregate 816,772, as against 386,195 for the same period of last year.

This output is being readily absorbed, no stocking up beyond the actual demand or sales in sight, with dealer or manufacturer, being apparent. At the same time, used cars are moving rapidly, a considerable improvement being reported in this phase of the dealer's business, and facilitating the disposal of new products.

The greatest gain this month is expected in truck production. Farmers give unmistakable signs of having returned to the buying market for motor equipment, both trucks and tractors, and although it is unlikely they will purchase as extensively as in other years, they will make a good start toward becoming a leading factor in 1924. Truck companies are reporting increased sales in the agricultural districts, with a continuance of a healthy demand in large industrial centers.

Parts makers are feeling the pressure of business, with unfilled orders on hand April 1 in excess of those at the beginning of March. Plant facilities are being taxed to the utmost by the insistance of directions for immediate shipment. Capacity operations will continue for several months, at least. In this branch of the industry, as in other branches, operations have been hampered somewhat by the shortage of skilled labor. Collections continue with practically no variation from satisfactory conditions existing during the past months.

Board to Examine All Drivers Created in Memphis

MEMPHIS, Tenn., March 31—Members of the recently created Board of Automobile Operators Examiners at Memphis organized this week and will determine the form of questionnaires to be used by applicants for drivers' licenses and skill tests.

The new ordinance requires that every driver of an automobile submit to an examination as to knowledge of the state and city traffic laws and skill in handling a car in heavy traffic, and the board is given authority to revoke the license of any person found guilty of reckless driving.

\$400,000 Spent by Timken Last Year on New Machinery

CANTON, O., March 31—H. H. Timken, president of the Timken Roller Bearing Co., in his annual report to stockholders, announces that \$400,000 was spent for new machinery and equipment last year, in addition to large expenditures for renewals and replacements and the development of new and better manufacturing processes.

"We are adding to the steel mill and tube mill machinery and equipment to the value of over \$750,000, most of which is installed, which will enable us to sell a greatly increased quantity of these products; in fact we have already contracted for the sale of this entire extra output," says President Timken. "This extra equipment also will enable us to reduce the cost of our steel and tubing for our bearing requirements. The volume of our business during 1922 was materially in excess of any previous year and from present indications our 1923 volume will exceed that of 1922."

BUYS LARGE BUILDING

BIRMINGHAM, Ala., March 30—The Murray Tire Co., one of the most successful of the tire distributors in the southeast, has purchased a large building in the North Birmingham industrial section and intends establishing a complete tire manufacturing plant. The building is said to be designed in such a manner that it will fit into a tire manufacturing plant with but few alterations.

OPPOSE LOCAL LICENSING

SYRACUSE, N. Y., March 29—Opposition to Governor Smith's proposed plan to transfer the work of issuing and revoking automobile licenses to the police and sheriff in each county and city, was voiced at a meeting of the legislative committee of the New York State Federation here.

THOMASVILLE ORGANIZES

THOMASVILLE, Ga., March 31—At a meeting attended by all of the Thomasville automotive dealers a few days ago the Thomasville Automobile Dealers' Assn. was formed, with W. L. Thornton, Jr., as president.

High Lights on Highway Meet Show Gasoline Tax Approval

Harrisburg Conference Attacks Law System, Charging Laxity

HARRISBURG, Pa., March 31—High lights of the nation-wide conference on highway matters, held at the State Capitol and attended by representatives of 21 states, were as follows:

Resolutions were passed, approving a tax on gasoline as a means of paying for road maintenance. By this means, according to Col. Frederick Stuart Greene, highway commissioner of New York, who introduced the resolutions, it is proposed that road users pay for maintenance of roads in proportion to their use of them.

Attacks were made by Gov. Pinchot and others on the present lax system of motor laws in Pennsylvania and New York.

Opinions were freely expressed that the growth of traffic of heavy trucks has made it necessary that future road construction be changed to meet the requirements of the added strain, rather than that truck operation be unnecessarily penalized and hardships put in its way.

Col. Greene expressed the view that the ideal type of road for heavy traffic has not yet been developed, but probably soon will be, and it will have qualities that will resist the steady pounding of the largest and heaviest trucks. Col. Greene showed that the tendency now is to build stronger and better roads as heavy traffic increases.

Thomas H. MacDonald, chief of the Bureau of Roads, Washington, who presided at the early sessions, said that, with the trend of automobile manufacturers to build lighter and cheaper cars, a resultant increase in traffic is to be expected as motor vehicles come within the reach of more people. He deplored the lack of financial support given to highway departments and added that highway financing had not been accorded proper consideration and that legislatures were not properly supporting road builders.

ELGIN TO BE AUCTIONED

CHICAGO, March 31-Assets of the Elgin Motor Car Corporation, which has been in bankruptcy for several months. will be sold at public auction on or shortly after April 26, according to a decision announced by the referee in bankruptcy in charge of the case. This decision followed failure of a plan for reorganization which was undertaken by a committee of stockholders headed by C. S. Rieman, formerly president of the company. A hearing will be held in the United States district court April 2 to fix definitely the time and conditions of The Elgin plant suspended the sale. manufacturing operations shortly after the appointment of a receiver last October and has been idle ever since.

Dealer Holds Own Educational Contest

PHILADELPHIA, March 31—The W. E. W. Motor Corporation, 918 North Broad street, distributor of Durant and Star cars, is holding a "Durant Educational Contest," appealing to students, a large number of whom are participants. Five hundred dollars in prizes will be awarded to those submitting the ten best reasons why the Durant is "Just a Real Good Car." There are also 250 free scholarships in the Durant Training School. The contest is linked up with advertising appealing to boys and girls who wish to learn how to drive a car.

Motor Truck Industries to Hold Advertising Council

DETROIT, April 2—Motor Truck Industries, Inc., will hold an advertising meeting early in April, either in Detroit and Chicago, at which representatives of advertising counsel for the different companies making up the organization will meet with the association's advertising committee to outline general plans for publicity and advertising.

The association's committee is headed by Frank Sim, advertising manager of Timken-Detroit Axle Co., and comprises the following members: L. B. Dudley, advertising counsel Federal Motor Truck Co.; C. D. McKim, Continental Motors Corp., and F. L. Edman, Transport Motor Truck Co.

The committee reports that it has now had printed 350,000 copies of its pamphlet setting forth the qualities of specialized unit vehicles which it is distributing to dealers.

AUBURN ADDS NEW DEALERS

AUBURN, Ind., March 29—The Auburn Automobile Co. announces the following additions to its distributing organization:

Bean Motor Car Co., Cathedral street, at Chase, Baltimore, Md.

V. E. Bromley & Son, 55-57 E. Main street, Granville, N. Y.

East Liberty Motor Sales Co., 5818 Penn avenue, E. E., Pittsburgh, Pa.

Mitchell Sales Co., 202 Franklin street, Rochester, N. Y.

S. P. Voorhees & Co., 519 Realty Bldg. Elmira, N. Y.

McDARBY PROMOTED AT MOON

ST. LOUIS, March 31—N. E. McDarby, for the last three years advertising manager of the Moon Motor Car Co., has been made assistant sales manager of the company, his new duties embracing an enlargement of responsibility. He will work in close connection with F. H. Rengers, the company's general sales manager. O. A. Life is the new advertising manager of the Moon company. For the last six years he has been sales and advertising manager of the Multiplex Fixture Co. of St. Louis.

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Favor Taxation by Weight of Automobiles; No Gas Tax

Twenty-three Manufacturers Endorse Move Made by Michigan Governor

DETROIT, March 31—Representatives of 23 automobile manufacturing companies indorsed the stand of Gov. Groesbeck for taxation of motor vehicles by weight basis only, as opposed to a combination of weight and gasoline tax, at a meeting this week called by the Detroit Automobile Club. A bill calling for a two-cent a gallon gasoline tax in addition to present license fees has been passed by one branch of the legislature but has been deferred in the Senate owing to the Governor's stand. The message to Governor Groesbeck follows:

"The undersigned representatives of the automobile industry stand united behind you in your proposal to make weight the only basis of motor vehicle taxation. We unanimously indorse your flat rate of 70 cents per hundred pounds on passenger cars. We urge you to veto the gasoline bill if passed by the senate, as this law would be a precedent of farreaching influence and prejudicial to our business."

Companies signing were Buick, Cadillac, Chevrolet, Columbia, Dodge, Earl, Essex, Ford, Gray, Hudson, Hupp, King, Lincoln, Maxwell, National, Oakland, Olds, Packard, Paige, Reo, Rickenbacker, Studebaker and Wills Ste. Claire.

Dealer With 400 Sales Since Jan. 1 Believes He Has Record

SPOKANE, Wash., March 31—C. G. Casey, sales manager for the Inland Empire Chevrolet agency, believes that his company has set a new high record for autoombile sales since the first of the year.

"Since Jan. 1 we have sold and delivered over 400 new Chevrolets," Casey said. "During the month of February, with all the cold weather and snow, we sold and delivered 128 cars. Last week 81 new cars went out of this place to new owners and I doubt if there is another make of car in Spokane that can show this volume of business. This year's models are wonderful and people seem to be recognizing this fact."

The Inland Empire Chevrolet agency is not the only Spokane automobile firm to report greatly increased sales since the first of the year. Many local dealers are announcing "car shortages" due to the fact that factories cannot supply their demands.

"A record year for Spokane automobile men" is the slogan up and down automobile row.

STANDARD LIQUIDATION STARTS

CLEVELAND, March 30—The first step to liquidate the \$20,000,000 Standard Parts Co. of this city was taken here when the Perfection Spring Co., Cleveland, and the Pontiac Spring Co., Pontiac, Mich., were sold on a bid of \$1,025,000

to Burton A. Howe of Grand Rapids, Mich. Service stations in New York, Cleveland and Boston were included in the sale.

Howe is a member of the securities house of Howe, Snow & Bartles of Grand Rapids.

Based on a book value, the bid for the two properties represents approximately 50 cents on the dollar.

Model Truck Show Room in Detroit Opened by G. M. C.

DETROIT, Mich., March 31—Model show room and dealer headquarters have been opened in the General Motors building in Detroit by the General Motors Truck Co., of Pontiac, in conjunction with Owen & Graham, Detroit distributors.

The new show room, occupying more than 5,000 square feet of floor space, in the largest office building in the world, will probably be the finest truck showroom in the country, when all the equipment has been procured.

In addition to the showing of many of its models, both of the regular truck type and the tractor-trailer combination, the General Motors Truck Co. will use this display room as a headquarters for visiting dealers. It will be comfortably furnished with davenports and chairs; a separate writing and conference room and every facility to make visitors comfortable will be provided.

GENESEE DEALERS ORGANIZE

BATAVIA, N. Y., March 31—Genesee county automobile dealers and salesmen have organized with the following officers: President, L. W. Woods, Batavia; vice-president, Ernest Townsend, LeRoy; secretary, Harry L. Slocum, Batavia; treasurer, Edward L. Hammond, Batavia. These officers will serve as directors, with C. D. Cover of Batavia as a fifth director.

MAY REORGANIZE ASSOCIATION

BURLINGTON, Ia., March 29—Leading dealers of this city this week informally discussed plans to revive the Des Moines County Automobile Trades Association, which has been permitted to lapse. Among the leaders at the session were William Mohnke, Fred Sheagren, W. B. Hunt, J. W. Dewein, G. C. Whitcombe, Bruce Walker, Earl Phillips and William Mariman.

PLAN TO MAKE VAUGHN CARS

GREENSBORO, N. C., March 30—E. N. Snew, general manager of the Irvine Automobile Co. of Greensboro, advises that the company expects to get into production on the new Vaughn car at its plant here in the near future, probably in the early spring, and will likely manufacture about 150 cars during the year. This car first was shown in 1921 but is not yet on the active market. The company also announces it has taken over distribution in the eight southeastern states of the Bessemer truck.

\$13,638,654.74 Assets of Maxwell and Subsidiaries

Balance Sheet of Dec. 31 Shows Condition of Company After New "First Year"

DETROIT, March 31—Consolidated balance sheet of Maxwell Motor Corp. and subsidiaries as of Dec. 31, 1922, shows current assets of \$13,638,654.74 and current liabilities of \$3,979,030.30. Other assets are listed at \$987,223.39; permanent assets at \$15,924,846.77; good will, \$25,030,296.08, and deferred assets, \$200,163.62. Total assets are shown as \$55.781.184.60.

Among current assets are listed: Cash, \$2,754,223.10; car shipments against B|L drafts, \$1,594,926.67; bank acceptances and certificates of deposit, \$307,331.04; customers' notes receivable, \$15,183,44; customers' and dealers' accounts, less allowance, \$276,110.76; due from Canadian government for duty refunds, \$90,-998.41; inventories, \$8,599,881.43.

Current liabilities include notes payable, 7 per cent gold notes, series B, of Maxwell Motor Corp., due June 1, 1923, and interest accrued thereon, \$2,336,-674.66; accounts payable \$1,095,015.67; accrued interest, taxes, etc., \$252,798.32; dealers' and distributors' deposits, \$294,-541.65.

STUDEBAKER TO BUILD FOUNDRY

SOUTH BEND, Ind., April 2—The Studebaker Corporation has announced plans for the erection of a grey iron foundry, the cost of which will be about \$2,000,000. Work is to start at once and the foundry is to be ready for operation before next winter, according to the plans announced by President A. R. Erskine.

The building is to be 720 ft. long and 680 ft. wide and will have 570,000 sq. ft. of floor space. It will be equipped for a production of 45,000 pounds of casting an hour, or a total of 180 tons in an eight-hour day. There will be a machine shop in connection in which casting will be partly machined before being sent to other plants. It is estimated that 1500 employes will be required.

NASHVILLE DEALER GETS TROPHY

NASHVILLE, Tenn., April 2—The Broadway Motor Co., Nashville Studebaker distributor, was one of the leaders last month in the nation-wide sales contest, which is being conducted by the Studebaker Corporation of America, winning what is known as the Vice-President's cup. The contest will continue through the year and permanent possession of the cup will be awarded on the basis of the full year's standing.

NASH SCHEDULE 60,000 CARS

KENOSHA, Wis., March 31—Declaring that orders and demands from distributors would seem to warrant a production of 100,000 Nash cars this year, C. W. Nash, president of the Nash Motors Co., stated that production would be limited to 60,000 cars.

Retail Sales Grow in All Sections

March Is Greatest Month in Cleveland Automotive History

Estimate That More Than 8000 Cars Have Been Sold in the City Alone

CLEVELAND, March 31—The present month has been the best March for sales of automobiles in the entire history of the automobile industry in this city.

A canvass of dealers and an examination of the records in the office of the county clerk where sales are recorded makes conservative the estimate that more than 8000 cars have been sold in this city alone during the month. Heretofore sales of 6000 cars in this city during the month has been considered an excellent record.

Distributors report that dealers in the rural counties are having a far better run of sales than they did last year. The farmer is more prosperous this year. The winter has not been a hard one, and the prospects are for good crops at high prices, and that means the farmer ought to come into the market even stronger when his 1923 crops are harvested.

Sales of enclosed models continued through March to be much better than a year ago. Most of the sales were made to persons who bought touring cars one, two and three years ago, and now want the higher priced models.

Sales Pick Up in Portland Territory Following Show

PORTLAND, Ore., March 31—With the automobile show well in the past, spring nicely advanced and the Portland dealers with excellent supplies of the latest models of their respective cars on hand, business throughout the Portland field in the automobile industry has picked up in an excellent way, and this spring now promises to be one of the best ever experienced here.

According to M. O. Wilkins Auto Information Service, the period since late February has seen a splendid increase in business, and the opening week this month showed a greater volume of new car retail business in Portland than any week for the past two years.

Despite the excellent market for new cars, the second-hand market is rather weak, and the dealers are cautious in taking trade-ins. With a few exceptions all Portland dealers have small stocks of used cars on hand and intend to keep the stocks small.

The wholesale business for Portland distributors selling to dealers throughout Oregon is better than for two years, according to the distributors. Several drive-aways of cars have been arranged during the last several weeks and diversions of stocks from the east to the smaller cities have been unusually heavy.

SALES ACTIVE IN NEW YORK

NEW YORK, March 31—Not only new cars, but used car sales are running strong in the metropolitan area. Distributors and branches handling the more popular cars are far behind, both on wholesale and retail deliveries, and the demand for new cars in all lines is gaining strength every day.

The used car outlook is particularly cheerful. Almost universal employment in the city and surrounding territory is bringing back into the market many people in the lower salaried and artisan classes who have not been buying for the past two years. Stocks of used cars are being cleaned out rapidly and those being taken on current trades are not remaining long on the salesroom floors.

Activity in All Classes of Cars in Central Ohio

COLUMBUS, O., April 2—Retailers and distributors in Columbus and central Ohio are much encouraged over the outlook for the spring and early summer, people are buying all classes of cars actively and there is a scarcity in some lines. While the more popular priced machines are in the best demand, still there is a good steady call for the higher priced cars ranging from \$2000 to \$6500. Cars in the class selling from \$1200 to \$2000 are selling briskly and the lower priced cars are also in their heyday.

Distributors have placed larger orders than ever before and find themselves in a position where it is doubtful if they can take care of orders. Mechanics, clerks, merchants and in fact all classes of people are buying. About the only hindrance is the fact that farmers are not yet prospering to a large extent and buying from that source is somewhat curtailed. Dealers predict the best spring trade in the history of the business.

LOUISVILLE DEALERS OPTIMISTIC

LOUISVILLE, Ky., March 31—Louisville automobile dealers have enjoyed the best season in the history of the trade during the past two months. Heavy buying began with the opening of the Automobile Show on Feb. 19, and since then the majority of the distributors have been unable to obtain enough cars from the factories to meet the demand. Hundreds of unfilled orders are on the books and purchasers are clamoring for new models.

Business was never better and there is every indication that it will continue excellent throughout the year. Almost without exception, the dealers are optimistic over the future.

TO SPEND \$1,000,000

DETROIT, March 31—Motor Products Corp. plans to spend \$1,000,000 for additional buildings and equipment for the Detroit plant, the increased facilities being made necessary by increased business, according to D. B. Lee, president.

Steady Advance of Retail Sales in Chicago District

Cold Waves, However, Have Retarded Buying Which Is Expected to Break Loose in April

CHICAGO, March 31—Retail sales of automobiles in Chicago and Cook county have been mounting steadily this month, although the rate of advance has been somewhat retarded by the extremely unseasonable weather. Cold waves have succeeded one another with such frequency and intensity that it may be said the weather for this month was the most severe of the winter. This has discouraged persons who had planned to buy cars with the coming of spring.

The demand, however, in the popular low price field has been such as to tax the ability of dealers and branches to deliver. In the case of the most widely selling low priced car the sales by the Chicago branch for the six months ending today have exceeded by more than 100 per cent the sales for the corresponding period a year ago. This applies to cars, trucks and tractors made by this company.

Prospects for the next month are that if the weather is at all seasonable the buying that has been dammed up by the cold will break with a flood that will create a new record for retail sales. Used cars have been moving with surprising celerity, due to intensive advertising by dealers and the fact that allowances have been kept down to such extent that selling prices are not unreasonable.

Sales Improve as Season Advances Throughout Texas

DALLAS, Tex., March 30—As the fourth month of the year approaches, the month when the "blue birds and martins begin to build in Texas," the retail automobile business was looking better than ever, according to reports from Dallas retailers. Sales are still exceeding those of the corresponding period last year and indications are the trade for the next month will be still better. The good results of the recent automobile show are still felt by the Dallas dealers.

Fort Worth retailers sold more cars in March than in any month for the last three quarters of a year. Indications for April business are bright. South Texas dealers reported sales increasing and collections good. The business was about normal in West Texas and South Texas. Trade was slow in East Texas, it was said. Accessory men and tire dealers reported good business. Truck dealers were making many sales and garagemen were rushed with repairing and repainting jobs.

White Company's Sales Were \$37,268,226.32 Last Year

Ninety Per Cent of Truck Business in 1922 Done by Ten Companies

CLEVELAND, April 2—The White Motor Co. in 1922 had gross sales of \$37,268,226.32 and net profits of \$3,770,617.73, which is a substantial gain over 1921, according to the annual report of the company just issued.

Adding sundry adjustments and deducting dividends of \$2,000,000 which have been made uninterruptedly since the company was incorporated, a balance of \$1,779,409.72 was carried to surplus account, making the total surplus \$4,461,073.41. Bank loans were reduced from \$3,600,000 to \$2,000,000, with an increase in cash from \$1,346,441.84 to \$2,528,966.18. The company carries customer paper without discounting, so that current assets and liabilities are shown in their actual rate of 3.9 to 1.

The report disclosed that truck business is centered in a small group of powerful and well organized companies. Of the 243,000 truck output in 1922, 90 per cent was the work of ten companies, including White with an output valuation exceeded only by Ford. The remaining 10 per cent output was divided between 140 companies.

FRIENDLY RECEIVER FOR STANLEY

BOSTON, March 31—Action brought by the company itself and some of its principal creditors in the Supreme Court of Massachusetts has resulted in the appointment of S. L. G. Knox as receiver for the Stanley Motor Carriage Co. of Newton, Mass. The action is declared to be friendly and the receiver has been instructed to prepare for increased production and expansion. Knox represents the First National Bank of Boston and formerly was chief engineer of the General Electric Co. No statement of assets and liabilities was filed.

The court action had been anticipated by the company, which was desirous of the appointment of a receiver in order to introduce new money and increase the output.

PEERLESS MAKES PROFIT

CLEVELAND, March 31-The Peerless Truck & Motor Co. made a profit of \$1,005,112 for 1922, as compared with a deficit of \$103,665 in 1921, according to an annual statement made public. January, 1923, sales totalled 577 cars, as against 115 in the same month a year ago, while February sales were 358, as contrasted with 195 in February of 1922. Shipments in March are averaging 25 cars a day, while the company has received orders for April delivery totalling 1130 cars. The trade to the present has been largely in closed models. Sales for 1922 totalled \$16,001,985, as compared to \$12,055,904 in 1921.

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CHANGE IN MONROE MODELS

INDIANAPOLIS, March 31—Strattan Motors Corp., which last week took over the Monroe plant and assets, announces that the only immediate change in the Monroe policies will be the elimination of the roadster model and the addition of a coach model to list at about \$1100. The full list of officers is now available; Frank S. Strattan, president; Frederick E. Barrows, Connersville, vice-president; Frank A. Kately, New York, secretary and treasurer.

Hope for Repeal of Tax Laws

WASHINGTON, April 2—Indications that the president will ask the next Congress to revise the tax laws has revived hope among the various organizations interested in the repeal of the discriminatory excise taxes on motor cars and accessories. The various associations have asked their members to take the matter up personally with senators and congressmen now in their home districts.

The fact that many changes will be made in the membership of the House Committee on Ways and Means at the next session, shows that the proposal may be considered.

WEEKLY SALES SHEET ISSUED

NEW YORK, March 31—Sherlock & Arnold, publisher of the Monthly Sales Analysis for the metropolitan district, has enlarged the scope of its work and is now issuing a Weekly Sales Analysis for the same territory.

The analysis gives a recapitulation of sales up to the week under review and at the same time goes into detail of the business transacted for that week.

For the week ending March 7, 1202 new cars weer sold, making total sales for the year in the metropolitan district 3013.

WEBB IS BARLEY AD MAN

KALAMAZOO, Mich., April 2—L. Earl Burridge has resigned as advertising manager of the Barley Motor Car Co., and will engage in a sales enterprise at his former residence, South Bend, Ind. Frank Webb, of the Gazette, has been named as his successor.

SALES GOOD AT INDIANAPOLIS

INDIANAPOLIS, March 30—Retail sales for March have been from 25 to 30 per cent ahead of last year's records. Practically all of the progressive dealers of the city say that the business will surely keep up and increase during April and May.

TAINSH WITH KISSEL

Hartford, Wis., April 2—John Tainsh, for nine years general sales manager of the Mitchell Motors Co., has been appointed vice-president in charge of sales of the Kissel Motor Car Co. He has taken up his new duties.

Complete Reorganization of Coats Steam Car Company

Greenville (O.) Banker Is Elected President of New Company

COLUMBUS, O., March 31-A complete reorganization of the Coats Steam Car Co., located at 1675 South High street, has been made and steps are being taken to get into production within a short time. In the reorganization Conrad Kipp, Greenville, O., a banker and general manager of the Greenville Home Telephone Co., was elected president; M. A. Pixley, president of the Erner & Hopkins Co., Columbus, is first vice-president; T. E. Moore, Columbus, second vice-president and general manager; G. Hickle, secretary-treasurer, and George W. Mannix, Jr., Greenville, chairman of the board of directors. Other members on the board are A. L. Henry, Indianapolis, and P. A. Kern, Zanesville.

G. A. Coats, who was formerly at the head of the company, is sales manager.

Deposits from dealers and distributors are said to aggregate \$40,000 which will be used to finance the production of the first 125 cars. The concern will make two models, the touring car to sell at \$1080 and the sedan at \$1495. The horsepower is rated at 15 and 25 in eserve, while the wheel base is 115 in.

ALABAMA DEALERS ACTIVE

BIRMINGHAM, Ala., April 2—The Alabama Automobile Trades Association has started a campaign for increased membership. The slogan is "A thousand in July."

In starting the campaign James Farley, secretary of the association, said: "We want to impress on the dealers of this state just what the association means to them. I don't believe there is a single one that will hesitate after they understand. One of the main things we wish to have them understand is that this organization is strictly a business institution. Some state dealer organizations in the past have conveyed the idea that it was all play and no work. Our chief aim is the accomplishment of better conditions for the automotive industry in Alabama, particularly as applied to dealers. We believe that we will reach our goal of 1,000 with ease."

SHIPMENTS RUN GOOD

DECATUR, Ill., March 31—Automobile shipments through this division point are running a close race with the lumber hauls and a solid train of 76 cars of automobiles, headed for western agencies, reached here recently. The train was cut here and the first 54 cars of Overlands sped on westward without delay. The second train followed immediately with 22 cars of Overlands and 20 other cars of automobiles, making 96 cars in the two trains.

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Exchange for Used Cars Is Plan of New York Dealers

Automobile Merchants' Association Decides to Put Plan to Work in Near Future

NEW YORK, March 31—Announcement was made at a meeting of the Automobile Merchants' Association of this city that the used car plan recently adopted will shortly be put into effect. The meeting was presided over by Lee J. Eastman, president of the association. A report on used car conditions in the West was made by F. E. Moskovics, vice-president of the Nordyke & Marmon Co., who has made an extensive tour of that section.

Moskovics mentioned a used car plan now operating in Anaheim, California, called the Orange County Plan. The plan operates as follows:

Dealers do no trading. Used cars are all handled by an exchange which makes the appraisals. The consignee pays for the cost of reconditioning and a 10 per cent handling charge. Privilege of marking down a car value every 30 days is given to the exchange provided the owner is given five days' advance notice. The exchange gives the consignee a certificate which permits the latter to borrow 50 per cent of the car value from the banks. This sum may be used as a down payment on a new car and the banks advance the remainder. The teeth in this plan lies in the fact that the banks will not finance any cars not handled through the exchange.

The Orange County Plan has worked so well that its scope is being broadened and Moskovics prophesies that the entire state of California will soon operate under it.

Denby Motor Truck Corp. New Name of Old Company

DETROIT, April 2—Denby Motor Truck Co. has been reorganized and has become the Denby Motor Truck Corp. with all the stock of the former company changed over to no-par stock in the new company. There will be no change in management, but J. Walter Drake, chairman of the board of Hupp Motor Car Co., and W. R. Kales, vice-president of Whitehead & Kales Co., are added to the board of directors, and with Edwin Denby will be principal stockholders. A. S. More will continue as president.

The company will make arrangements for the removal of its plant to a new location within the next few weeks and will prepare to extend its manufacturing facilities. More reports business now to be better than for the past three years.

OLDS FLAT RATE

LANSING, Mich., April 2—A uniform flat rate schedule has been worked out by the Olds Motor Works. This will be placed in operation by Oldsmobile dealers throughout the country. While termed flat rates, the system operates on the maximum estimate basis, the actual charges to the customer being made according to the amount of time and materials applied to the job, not exceeding, however, the advance estimate.

Used Car Sales at Spokane Raised to a Higher Plane

SPOKANE, Wash., March 31—Automobile dealers here are no longer looking at the used car business in a "half hearted" or auxiliary way. They have come to realize that much of their revenue depends upon a successful used car department and with this thought in mind have raised their used car business to a much higher plane.

"Used car dealers are exercising more care in selection, conditioning and redistribution, and as a result of their efforts are gaining the confidence of the motor buying public," Harry L. Olive, pioneer automobile man of Spokane, declared in talking on used cars.

"The general attitude toward used cars is being reflected in the spring sales and it is safe to say that the volume of business in the used car market will increase 25 per cent this month over March of last year when \$666,000 of business was done in used cars by 17 dealers of the city."

WHEEL COMPANY TO REORGANIZE

DETROIT, Mich., March 31—Northern Wheel Co., of Alma, Michigan, has been placed in a receivership on the application by F. W. Ruggles, one of the principal creditors, as a means of conserving the assets of the company. Orville Allen of Alma is the receiver. A reorganization of the company will be effected, it is reported, with James F. Moulton of Grand Rapids taking an active part.

VETERAN DEALER RETIRES

INDIANAPOLIS, March 30—H. T. Hearsey, who has been selling transportation vehicles, cars and accessories since 1886, retires April 1, when the doors of his wholesale and retail accessory business will be closed voluntarily, the stock and fixtures having been sold in the last two months.

USED CAR CORPORATION

ROCKFORD, Ill., March 31—Twelve dealers in used cars in this city have united in launching a corporation to deal in used cars. The company will probably be named the Rockford Used Car Association and it is expected that the organization will be completed, officers chosen and the company functioning within a month.

R. & V. NEW OFFICES

EAST MOLINE, III., March 31—Occupancy this week of the remodeled Kirkwood hotel by administrative offices of the R. & V. Motor Co. is in line with the program of expansion mapped out by the company and will make available greater factory space. The basement of the new office building will be used for retail sales and display rooms.

Willys-Overland Co. Report Shows \$2,779,831 as Profit

\$2,597,716 Set Aside to Cover Price Allowance on Cars and Other Things

TOLEDO, O., March 31—The annual report of the Willys-Overland Co. for 1922, made public this week, shows the company and subsidiaries earned net profits of \$2,779,831 after providing for interest, depreciation and other operation expenses.

The statement shows \$2,597,716 has been set aside to cover price allowance on cars, reserve against merchandise inventories, and extraordinary expense in connection with its gold note issue.

In 1921, the company reported, after providing for expenses, interest and depreciation, a deficit of \$12,506,101 and, in addition, charged off \$11,054,288 for reduction in value of investments in affiliated companies, tool replacements and for additional provisions for loss of commitments, making the total deficit for 1921 \$23,506,389.

These figures make the 1922 statement all the more remarkable. The statement for 1922 shows assets of \$58,637,700, including \$29,509,3227 of real estate and machinery holdings, \$1,134,976 investment in other companies, inventories amounting to \$24,171,209, miscellaneous notes of \$284,995, trust fund of \$47,770, notes and accounts receivable amounting to \$2,798,948, cash of \$272,054 and deferred charges of \$238,420.

In the statement book, value of goodwill, patents and other items are reduced to \$1.

Court Upholds Differential Discounts by Manufacturers

NEW YORK, March 31—The automotive industry will be interested in the decision handed down by the United States Court of Appeals in the test case brought by the Mennen Co. against the Federal Trade Commission.

Judge Henry Wade Rogers wrote the decision, and as interpreted by the lawyers, the decision holds that the Mennen Comay sell its products to the wholesalers at one price and to retailers at a relatively higher price, making a discount to the wholesalers for service rendered. It is further decided that the Mennen Co. is in no sense a monopoly and that it might even refuse to sell to retailers if it so desires.

W. F. THOMPSON WITH PULLMAN

CHICAGO, March 30—The Pullman Co. announces the appiontment of W. F. Thompson, an experienced automobile manufacturing man, to have full charge of the manufacturing facilities of its automobile body plant at Pullman. Thompson has been actively connected with the Peerless, Cadillac and Packard companies, and has been associated with companies manufacturing bodies for other automobiles.

Citroen to Demonstrate Cars in U. S.

Sahara Expedition Returns to Paris After Notable Trip

Type of Vehicle Proved Successful to Be Used in Passenger Transportation

PARIS, March 16 (By Mail)—After an absence of two months, the members of the Citroen mission which crossed the Sahara desert by automobile reached Paris this morning and were formally welcomed at the Citroen factory in the presence of local authorities and the entire staff of workers. The original plan of crossing France by road was abandoned at the last moment, the cars being brought from Marseilles to Paris by train.

The drivers and mechanics reported that the double journey across the Sahara was accomplished without any mechanical difficulties. A considerable physical effort was required in order to accomplish the journey owing to the climate. The highest temperature recorded during the trip over the desert was 134 degrees F. and the lowest 10 degrees below freezing point. With a following wind the crew suffered from the heat, but the system of lateral radiators and a condenser on the top of the main radiator proved quite satisfactory for the engines, even with thermo-syphon circulation, and the amount of water consumed was very slight.

To Use Creeper Cars

PARIS, March 17-Citroen-Kegresse creeper band automobiles are to be used by the French Line steamship company for the passenger services it organizes in Algeria, Tunisia and Morocco. The first use of these vehicles will be made for sightseeing trips from Touggourt, in Southern Algeria, to Tozeur, in Southern Tunisia. At present the round trip is made by camels, mules and horses, and occupies ten days. With the use of Citroen creeper track cars the journey will be cut to three days. Next season a more extended use will be made of Citroens for other passenger services in Northern Africa.

PEORIA DEALERS SHOW

PEORIA, Ill., March 31—The Peoria Automobile Dealers and Accessories Association gave their annual show in the Inglaterra dancing pavilion, opening Monday, March 26, and concluding Friday, March 30. This was the first time that this structure was selected for the annual event. Since the destruction of the Coliseum by fire, the dealers here have essayed shows in some of the uptown sales agencies, but with indifferent success. The Inglaterra pavilion, with its large floor space, proved ideal for show purposes, while the splendid opportunities for artistic decorations were taken advantage of to the fullest possible extent, the result being that this year's event was the most attractive in the history of the local dealers. The show was kept open from 10 a. m. until 11 p. m. daily and was thronged by an enthusiastic group of motorists. Practically every motor car dealer of Peoria was represented. F. C. Zillman, secretary of the state dealers association, served as manager.

COLE SCHEDULE IS 20 CARS

INDIANAPOLIS, April 2—Production of 20 cars a day was the schedule set by the Cole Motor Car Co. for attainment early this month. Officials of the company stated that production in March was 80 per cent greater than in March of 1922. The new merchandising plan which practically bars trade-ins is said to have greatly increased sales through the reduction in price.

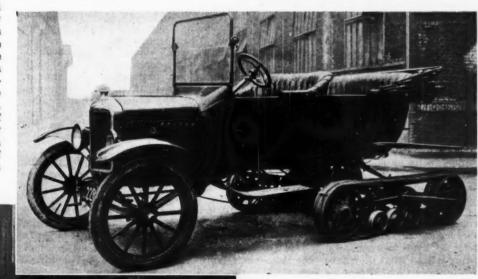
Two Fords Equipped to Cross Deserts Being Brought Over

Other Vehicles From Sahara Expedition Include Citroens and Mors With Creeper Treads

PARIS, March 22—In addition to three Citroen flexible creeper track automobiles fresh from the Sahara expedition, Andre Citroen, who is sailing from here on March 28 aboard the Olympic, will bring with him a four-passenger Ford, a one-ton Ford, and a high-speed Mors, all equipped with the Citroen-Kegresse system of rubber and canvas creeper band

During his stay of one month in the United States, it is the intention of M. Citroen to give demonstrations of his machines under various conditions. The Ford has had its rear wheels removed and the creeper track mechanism substituted, the drive being obtained from a sprocket on the end of each of the differential shafts, and a pair of chains to a sprocket on the rear drums carrying the flexible band. The chain gives an additional gear reduction and allows the Ford to run at 18 to 22 miles an hour.

For the one-ton Ford the same general design has been followed, with a further gear reduction by means of the chains, the only differences being that the creeper band is broader and heavier, with a face width of 6 in. This track has a speed of 10 miles an hour, and with its creeper bands can operate successfully across country, in mud or sand.



These are the two Fords which will be brought to America by Andre Citroen to demonstrate use of creeper bands for travel across sandy stretches

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Survey of Tire Field Planned by Rubber Association Group

Manufacturers Hope to Obtain Information That Will Help Dealers Make Profits

NEW YORK, March 31—The Rubber Association of America, through the tire manufacturers' division, is about to undertake a study of costs, turnover and kindred subjects having to do with profits and losses in the tire field. In this work the association will have the cooperation of the Harvard Bureau of Business Administration, which has conducted similar investigations in various other mercantile fields.

The first step in the survey will be a preliminary questionnaire to be sent to 25,000 dealers to obtain information on which will be based the final plan of the campaign. As in other fields, the work will require many months for completion.

The manufacturers hope, by gathering and disseminating information on dealer costs and operating methods, to be able to lay before dealers information which will assist them in making their businesses more profitable. It is hoped that the survey will result in suggestions for business methods which will generally improve merchandising conditions in the entire industry.

How Some Memphis Dealers Sell Used Cars Profitably

MEMPHIS, Tenn., March 31—Some of the largest automobile interests of Memphis give constant and careful attention to their used car departments. Schlecht Motor Sales Co., 247 Monroe avenue, has a department of this kind and features various makes. "Our Used Cars Don't Act Used" is this company's motto.

The Mississippi Valley Motor Co., 918 Union avenue, makes special showing of its used cars and admonishes the public to "Come before they are all gone."

Abernathy-Riddick Auto Co., 336-338 Monroe avenue, stresses convenient terms on used cars, and urges that the economy of the used car lies not in the initial cost but in the future cost.

The Bluff City Buick Co., 395 Monroe avenue, in its used car department, says they are selling like hot cakes, because the prices are right.

The Oldsmobile Dist. Corp., 239 Monroe avenue, features used touring cars, trucks, roadsters in limited numbers and at special values. These and other Memphis firms use printers' ink in the spring telling what they have. The Automobile Sales Co., 259 Monroe avenue, W. G. Fuller, manager, also has an active department of that character.

BIG GARAGE PLANNED

SPRINGFIELD, O., March 30—Following the incorporation of the Columbia Garage Co. with a capital stock of \$75,000 preferred stock and 1500 shares of common stock, no par value, announcement was made by those interested that a five-

story fireproof garage building will be erected in the central district of Spring-field within half a square of Hotel Shawnee and the Court House, in East Columbia street. Work on it will be started as soon as the weather will permit.

Uncle Joe's Chauffeur Becomes Automobile Dealer

DANVILLE, Ill., March 30—Lester Morris, formerly chauffeur and companion to Uncle Joe Cannon, veteran Congressman, has announced to his many friends here and in Washington that he has taken over the sales and service in six counties in Illinois and Indana of the Durant and Star line.

Newspaper announcements some time ago said that Lester Morris had taken on this new line in this territory, but few knew that Lester Morris was the "Red" Morris they all knew as Uncle Joe's chauffeur. On Cannon's return from Washington a couple of weeks ago Morris immediately took on his new duties. He has leased a three-story building in the heart of Danville's auto row and after a thorough remodeling will have one of the best stations in the territory.

It is also to be noted that this is Morris' second job in his lifetime, as he had been in the employ of Cannon for the past 14 years, ever since he was a boy just out of school. Associated with Morris in his new venture is Clay Forcum, for many years service manager for the local Cadillac dealer.

TRACTOR PAMPHLET ISSUED

WASHINGTON, March 24—A pamphlet on tractor costs as to depreciation, fuel, repairs, upkeep, interest and lubricating oil, has been compiled by the Department of Agriculture, known as Farmers' bulletin 1297. Copies may be had upon request to the department.

Other costs, shown in the booklet, making up the total cost are: Labor in repairing and attending the tractor, housing, grease, taxes and insurance. Summed up, the figures make a credible showing in favor of the tractor vs. horse-drawn equipment, based on a nation-wide survey.

FRANCE ON GAS IMPORT

WASHINGTON, March 24—French legislation approved Feb. 28, 1923, provides that, commencing six months from that date, importers of motor gasoline into France will be required to purchase from the government each month a quantity of motor alcohol equal to one-tenth of the volume of gasoline imported during the previous month.

THREE COMPANIES CONSOLIDATE

GREENFIELD, Mass., March 30—The Frank O. Wells Co., Inc., and the American Tap & Die Co. of this city and the Williamsburg Manufacturing Co., of Williamsburg, Mass., have consolidated, with the Wells company as the holding company. Joint capital represented in the merger is in excess of \$1,000,000.

Tractor Prices Uncertain, Say Some Manufacturers

Several Withhold Publication of Lists Because of Rapidly Changing Conditions

CHICAGO, April 2—Considerable uncertainty as to tractor prices appears to exist among the manufacturers, according to information received from more than a dozen firms. Only about half of the companies were prepared to state prices at which dealers may buy their tractors. Most of those companies giving prices stated they were confidential and not for publication.

One company, stating that it is not its policy to publish prices when they are subject to change, quotes prices in effect April 1, showing considerable increase. Another company states that discounts to dealers vary according to the annual sales volume and the territory covered.

Another company says: "We are not giving out prices of our tractors and other machinery, as conditions are such that it may be necessary for us to change them from time to time and we do not think it policy to have them published broadcast."

It is impossible to publish prices of tractors, says one company, "for, as a matter of fact, prices vary in different parts of the country in order to meet different special conditions. For instance, the length of time the dealer wants to take in paying for the machine makes a difference in the price, for there is a very material difference for spot cash and time, and the longer the time the higher the price."

Another company says it does not care to list prices "owing to the uncertainty of the present price situation."

TIRE BUSINESS SUCCESSFUL

NEW YORK, March 31—The report of the Lee Rubber & Tire Corp. for the year ended Dec. 31, 1922, shows net profits of \$370,493 after charges and Federal taxes, equivalent to \$2.47 a share on the 150,000 shares of no par common stock, compared with net profits of \$9,238, or six cents a share, the previous year. Net sales for this year amounted to \$6,468,208, against \$7,358,436 in 1921.

CINCINNATI ANNUAL MEET

CINCINNATI, March 31—The annual meeting of the Cincinnati Automobile Dealers Association will be held May 1. A nominating committee appointed by President Frank Santry is composed of W. G. Fuller, chairman; M. W. Jennings, A. A. Kattus, Richard Herold and A. T. Herschede.

VANE AT WATERLOO

WATERLOO, Ia., March 31—C. A. Vane, general manager of the National Automobile Dealers' Association, was speaker at the Blackhawk Motor Trades Bureau meeting last week and addressed a group that filled the Chamber of Commerce rooms.

CONCERNING MEN YOU KNOW

Lester J. Meyer was recently appointed advertising manager of the Lathrop-McFarland Co., Oldsmobile distributor at Indianapolis. Meyer will have charge of local advertising in Indianapolis and will devote considerable time to promotional work among the dealers under the Lathrop-McFarland Co.

Lathrop-McFarland Co.

That the automotive industry typifies American industrial genius and has been one of the chief means of this country's progress in commerce and manufacturing, was the gist of a radio address delivered by H. H. Rice, president of the Cadillac Motor Car Co., from station WDAL, Jacksonville, Fla., before his recent return from a trip through the South during which he visited Charleston, S. C.; Savannah, Ga., and Jacksonville, Miami, Tampa, St. Petersburg and Orlando, Fla.

L. G. Dodge has been appointed assistant sales manager of the Olds Motor Works, in charge of Territorial Organization.

L. F. Murphy has been appointed manger of the Indianapolis branch of the Studebaker Motor Corp., and Harold Ball has been made manager of the new used car and service department building just opened by the branch.

The United States Motor Truck Co. has appointed R. Ralston Jones, Jr., Indianapolis district representative.

Harry T. Gardner, manager of the Cincinnati Automobile Dealers Association, has been ap-pointed manager of the Fall Festival, an im-portant exhibit to be held in Cincinnati next

Harry T. Scott, formerly sales manager of the Detroit Twist Drill Co., has resigned to become New England representative of the Whitman & Barnes Manufacturing Co. His headquarters will be in Hartford, Conn.

J. G. Weddington has been placed in charge of the office opened by the Chase Companies, Inc., of Waterbury, Conn., in Atlanta, Ga. He will represent both the Chase Metal Works and the Waterbury Manufacturing Co. He is located in the Rhodes building.

W. A. Smith has resigned as vice-president and eneral sales manager of the Mercer Motors Co., renton, N. J., after twelve years' connection ith that concern. The resignation is effective pril 15. As yet no successor to Smith has een appointed nor has Smith announced his

future plans. However, he is figuring on a connection which will keep him an active factor in the industry.

Steve Butler, head of the Southern Motor Co., Memphis distributor for the Cadillac, president of the Memphis Chamber of Commerce, is to have a new honor. He is to be the president of the Southern National Bank shortly to open in Memphis.

The Lowry & Blackman Co. of Atlanta, manufacturers of the Lowry Free Wheel Steering Lock, announce the appointment of J. W. Holliday as assistant sales manager.

The entire plant of the Perfection Battery Manufacturing Co. of Chicago, manufacturers of automobile batteries and farm light and power equipment, is to be moved shortly to Atlanta, according to Howard Glenn, head of the company, who has lately been in Atlanta arranging for the transfer of the business.

Harry T. Clinton, for several years general sales manager of Fiat, has been appointed assistant general manager of the Cortland Cart & Carriage Co., Sidney, N. Y., manufacturer of Hatfield cars.

J. B. Siegfried, sales manager of the Motor Wheel Corp., is convalescing following an operation for appendicitis at the Sparrow Hospital in Lansing.

In Lansing.

R. F. Reece, formerly a motor truck representative in Kansas City, will have charge of the order department at the factory of General Motors Truck Co., Pontiac. J. A. MacDaniels, formerly manager of the Dallas, Texas, branch, has been appointed district sales manager in that territory succeeding Pierre Schon, who is taking up sales duties at the factory.

A. B. C. Hardy, president of Olds Motor Works, is spending several weeks in the South. Campbell Wood, for the past few years connected with the Klaxon Company in various capacities, and recently made manager of the Motor Equipment Division, headquarters in Detroit, has resigned. He has not yet announced his plans for the future.

George B. Gillespie, well-known automobile branch manager of Memphis, Tenn., has joined the Peerless Motor Car Co. of Cleveland, as factory sales representative for the territory of St. Louis south to New Orleans. He will make his headquarters with the Lilly Carriage Co., Union avenue, Memphis.

Busses Tried as Business

Stimulant in Small Towns ATLANTA, Ga., March 30-The motor bus as a means of stimulating trade for the retail merchants of a small or medium sized city, through the establish-

ment of regular routes operating through the rural districts and the nearby towns and villages, was an experiment that was tried out some months ago by a group of the retail dealers at Ensley, Ala., who organized and incorporated a company under the name of the Ensley Merchants' and Business Men's Bus Line, Inc., all of the capital stock of the company being subscribed by the merchants who were in the city association. As stated, the movement at the time of the organization of the company was as an experminet only, but as things have since turned out it has proven a highly successful venture, according to a recent report of the operations of the line by George R. Byrum, who is the secretary of the company.

Not only have the bus lines that the business men thus established operated from the start on a self-supporting basis, but it is estimated by Byrum that they have brought thousands of dollars in additional trade to the merchants of Ensley-trade that would not otherwise have been secured, and a large part of which undoubtedly would have gone to the mail order houses.

DEALERS ARE CONTENT

MOLINE, Ill., March 31-March has been behaving like the proverbial lion, but until the last week of unseasonable frigidity swept this valley, the automobile dealers were swinging into their spring sales stride with lamb-like contentment. For the first fortnight of the month sales were well in advance of last year's records and the seasonal rush which usually begins late this month and runs through May and June, was well under way when the subzero wave arrived.

LICENSE COURTESY EXTENDED

PORTLAND, Ore., March 31-A courtesy of 90 days use of the Oregon highways to outside motorists is now extended, as a result of an amendment to the motor vehicle law. In the past, but 30 days has been allowed. amendment further provided that all motorists entering the state from outside, with foreign cars, be required to register their cars and get a permit. No fees will attach to this registration or per-

GREENE CO. (PA.) SHOW

WAYNESBURG, Pa., March 31-The fifth annual Greene county automobile show will open in the armory here on April 4, continuing four days. Frank L. Hoover is manager.

May Invite European Makers to Next New York Exhibition

Bigger Quarters at New Location Makes Possible the Admission of Foreign Cars

NEW YORK, March 31-European automobile manufacturers may be invited to participate in the next national automobile show to be held in New York City next January because of moving the big exhibition into larger quarters. The shift from the Grand Central Palace to the Eighth Coast Artillery Armory with its floor space of close to 175,000 square feet in comparison with 114,000 in the Palace, makes possible this probable invitation.

Before Samuel A. Miles, the N. A. C. C. show manager, sailed for Europe last week, he conferred with the Chamber's show committee and he was empowered to visit the London and Paris show exhibitors and take up with them the question of including foreign makes of cars in the Armory show. Hitherto this lack of space has made it impossible for the Chamber to give the foreign cars proper representation. In the last show not one imported car was displayed and the year before room could be found only for the Itala and the English Vauxhall. Prior to this Fiat for years was about the only foreign car exhibited, it being cared for because of the American factory it maintained.

If foreign cars are admitted in the Armory exhibition, the scope of the show will be broadened and it will become as truly international in character as the Paris and London shows.

MERCER MOTORS PLAN

NEW YORK, March 30-Mercer Motors Co.'s plan for readjustment of the debt and for recapitalization calls for the creating of a new issue of Class A stock, not to exceed 250,000 shares of \$4 par value. Of this the common stockholders are asked to purchase 100,000 shares at par, the proceeds to be used for working capital. Holders of the \$1,495,475 outstanding four-year 7 per cent sinking fund collateral notes will have the option of exchanging their notes for the remaining 150,000 shares of Class A stock on the basis of 100 shares of stock for each \$1000 note or \$200 in cash and fifty shares of stock for each \$1000 note. The cash for the latter option is to be raised through stockholders buying the stock not taken by noteholders at the stated amount of \$4 a share. There will be no change in the position of the holders of the 8 per cent sinking fund bonds.

BATTERY FIRM HAS NEW PLANT

CHICAGO, March 30-Am-plus Storage Battery Co., whose factory at 741 Van Buren street, was practically destroyed by fire early this year, has established a new plant at 429 West Superior street, and is equipped to produce batteries on a larger scale than before.

BUSINESS NOTES

The Chanslor & Lyon Co. has moved into its new building at Polk and Ellis streets, San Francisco. It is a four-floor and basement structure with 67,000 sq. ft. of floor space and is designed for a wholesale business. The company now operates eight exclusively wholesale stores in San Francisco, Los Angeles, Fresno, Oakland, Portland, Tacoma, Seattle and Spokane and employs about 400 persons.

The Keys Motor Supply Co. of East Liverpool, O., has been incorporated by C. R. Larkins and others, with a capital of \$20,000 to buy and sell at wholesale and retail automobile accessories.

The Ashland Tire & Rubber Co. of Ashland, O., has been incorporated with a capital of \$300,000 to manufacture, buy, sell and deal in rubber goods.

The Smith & Neil Co. of Jacksonville, Fla., has acquired the plant and properties of the Florida Paint Removing and Motor Cleaning Co., and is planning immediate remodeling of the plant for the manufacture of automobile trucks.

The Lomar Mfg. Co. of Middletown, O., is rapidly increasing its output of Lomar shock absorbers. The company was established in Middletown about a year ago.

Middletown about a year ago.

The Northern Rubber Co. has been incorporated under the laws of Ohio by L. J. Schott, former president of the Amazon Rubber Co., and R. W. Kent, former vice-president of the Republic Tire & Rubber Co. The new company has purchased for \$200,000 the plant of the defunct Biltwell Tire Co. near Akron, and expects to resume manufacturing operations there April 1 with a daily capacity of 600 tires and tubes.

Whitman & Barnes Mfg. Co. will transfer its New York office and warehouse on May 1 from 664 Reade street to 99 Chambers street. Frank W. Oliver will continue in charge.

Stearns Motor Mfg. Co. of Ludington, Mich., manufacturer of industrial and marine engines, announces the opening of a sales and service branch in Detroit at 3420 McDougal avenue.

Martin-Parry Corp. reports a net income for the year 1922 of \$402,248 after charges and Federal income taxes. The amount is equivalent to \$4.02 a share earned on the 100,000 shares of no par value capital stock, compared to a net income of \$802 or 8 cents a share, in 1921. Net sales this year were \$4,327,685, compared with \$2,424,879 for 1921.

The Indiana Piston Ring Co., Hagerstown, Ind., announces a large number of jobbers have recently taken on the distribution of the Perfect Circle Oil-Regulating rings made by that company.

The Hoosick Engineering Co., Inc., Hoosick Falls, N. Y., recently incorporated, is manufacturing a line of standard ignition parts and is planning to bring out a number of automotive accessories. Forrest H. White is president.

Van Wheel Corp., Oneida, N. Y., is adding \$30,000 worth of machinery and stock to its manufacturing facilities in order to take care of the increase in business. The company is preparing to meet a demand of 1000 wheels a day.

The General Motors Exchange Corporation, the insurance division of General Motors, has announced the opening of new branches at 528 Commonwealth avenue, Boston, Mass.; Lincoln Bank Bldg., Minneapolis, Minn., and 3636 Olive street, St. Louis, Mo. These offices will serve Oldsmobile dealers in the adjacent territories.

SOUTHERN JOBBERS MEET

ATLANTA, March 30—The first 1923 meeting of the Southern Automotive Equipment Jobbers' Association was held at the Chamber of Commerce auditorium in Atlanta Friday and Saturday, March 23 and 24, with practically a 100 per cent membership attending. Thirty of the leading jobbers of automotive equipment in the southern states were present, and about 35 other representatives of factories manufacturing equipment in all parts of the country.

ROLLS-ROYCE STEPS UP

SPRINGFIELD, Mass., March 31—Rolls-Royce production here will register a new high level this month. Fully 10 chassis a week are being delivered, and with the enlarged coach works in complete operation, the production of bodies is even with that of the chassis. Incoming orders are such as to assure continued high momentum throughout

DEALERS AID POLICE FUND

PHILADELPHIA, March 30 — The Philadelphia Automobile Trade Assn. has forwarded, through its executive secretary, Charles C. Bulkeley, \$200 for the police pension fund, in appreciation of the efficient service rendered by the police on duty during the Automobile Show at the Commercial Museum, in January.

GOOD SHOW AT PORTLAND, ME.

PORTLAND, Me., March 31—Gate receipts substantiated the opinion that the Automobile Show which has just closed in this city was one of the best ever held in Maine. Considering the very unusual amount of snow on the ground in Portland at this time, the sales were exceedingly good.

Book on Care of Tires to Be Distributed to Public

Manufacturers Have Prepared Pamphlet as Second Step in Campaign to Educate Car Owners

NEW YORK, March 30—A 20-page book on "The Care of Tires," soon to be distributed to automobile owners through the medium of tire manufacturers and dealers, marks the second phase of a campaign undertaken by the tire manufacturers division of the Rubber Association of America to lengthen the life of tires.

The association has already issued to dealers two posters for hanging in tire stores and service stations, one poster stating and explaining briefly the standard warranty which was adopted following elimination of the mileage guarantee and the second giving pointers on the proper care of tires. The second poster is illustrated.

The book, which will run into millions of copies with the hope of reaching a large majority of the motorists of the country, takes up the care of tires in detailed text and illustrations under the subjects of inflation, pressure, overloading, oversize, treadwear, neglected tread cuts, side wall wear, rims and tubes. The book is concluded with the statement of the standard tire warranty and its advantages for tire users.

It is the aim of the association, through its educational campaign, to get car owners to get more mileage out of their tires, thus reducing costs to them and at the same time cutting down the losses sustained by manufacturers and dealers in making adjustments.

25th WINTON ANNIVERSARY

CLEVELAND, March 31—The Winton Co. is staging a national sales contest for its dealers in commemoration of the twenty-fifth anniversary of the sale of the first Winton car on April 1, 1898. The order for this car was placed with Alexander Winton on March 24, 1898, by Robert Allison, a mechanical engineer of Port Carbon, Pa., and delivery was made the following April 1. This is generally said to have been the first bona fide sale in the United States of an American built motor car.

ATLANTA FORD BRANCH BUSY

ATLANTA, Ga., March 31—From Jan. 1 to the present date has been the most active period in the history of the Atlanta branch of the Ford Motor Co., according to an announcement by W. W. Mitchell, manager of the branch, with indications promising that March will be the biggest month in gross sales the branch has ever experienced. Production has now reached 250 a day, and this is to be further increased on completion of the addition now being constructed.

Rubber Association Head Says Britian Will Ruin Own Business

NEW YORK, March 31—Horace De Lisser, president of the Rubber Association of America, in an announcement of the acceptance by Herbert Hoover, secretary of commerce, of his association's cooperation in the rubber survey the government is making, also answers Winston Churchill, former colonial secretary of Great Britian, and at the same time gives warning of a threatened crisis in the American industry because of the Stevenson restriction act.

De Lisser says that the association which he represents is convinced that the British policy threatens not only the rubber industry here but throughout the world. The Stevenson plan, he thinks, threatens to introduce wild speculation in rubber prices and that its ultimate effect will be to curtail rubber production on the plantations, which would be ruinous to the rubber growers. "This association," he says, "believes that the policy of the British colonies today will be far more injurious to the plantations than the rubber industry in this country."

FORD BETTERS BEST DAY

DETROIT, March 30—Ford Motor Co. on Monday this week increased its record output for one day to 5759 cars and trucks, an increase of 60 over the former previous mark made Aug. 29 last. By April production will be established at approximately 6000 daily, which mark it is expected will be maintained throughout a large part of the year.

HEWITT ANNOUNCES INCREASE

BUFFALO, N. Y., March 31—Hewitt Rubber Co. announces an increase of approximately 10 per cent in price of its tires and tubes.

IN THE RETAIL FIELD

The Clifford-Jacobs Mfg. Co. has been organized at Champaign, Ill., and will open a factory for the manufacture of drop forge parts.

The Mason Towle Co., Cincinnati Dodge distributor, has moved into a new home at the head of Gilbert avenue. The new building cost between \$175,000 and \$200,000.

The Rickenbacker-Wheat Co., Cincinnati Rickenbacker agency, Robert Wheat, manger, will soon be a close neighbor of the Mason Towle Co., having erected a new sales and service building on Gilbert avenue.

Clifford Renzenbrink, Cincinnati representative of the Westinghouse Air Spring Co., has taken the Mason Towle (Dodge) service station on Jackson street, having outgrown his old quarters at Vine and Canal streets.

at Vine and Canal streets.

The Gabriel Snubber Sales and Service Co., Cincinnati, William H. Matthews, manager, is now stationed in its new building at Court street and Broadway.

E. R. Davidson, sales manager of the Westcott-Cincinnati Co., is having his new place of business at Reading road and June street decorated, preparatory to moving in and holding a formal continuous.

Thomas F. Smith, 4460 Oakenwald avenue, Caicago, has been appointed Chicago distributor for the American Motors Corp.

Zorn Motor Sales Co., Oak Harbor, O., Studebaker dealer, has opened new sales rooms and offices in the Otto Reider Hardware building.

New Auburn dealers are reported as follows:
Auburn Sales Co., Inc., 1724 L street, N. W.,
Washington, D. C.; Columbus-Auburn Co., 780
N. High street, Columbus, O.; Harry Spangler,
Inc., 1691 Bedford avenue, Brooklyn, N. Y.;
Auburn Des Moines Co. (George A. Peak), 1214
Grand avenue, Des Moines, Ia.

Grand avenue, Des Moines, 1a.

Among new Maxwell-Chalmers dealers are the following: Pascal Motor Co., 520 Springfield avenue, Summit, N. J.; Rutherford Motor Sales Co., Inc., 151 Park avenue, Rutherford, N. J.; Frank P. Jacobs, 518 Lehigh avenue, Philadelphia; B. Wilson Cox, 209 East Main street, Norristown, Pa.; Johnson Bros., Webster, N. Y.; F. C. Spicer Auto Sales, Eaton Rapids, Mich., and Etherton's Garage, Carbondale, Ill.

Wolf Motor Co., 416 Clark street, Waverly, Y., has been granted a Maxwell-Chalmers franchise.

Rexer's Garage, 5139 North Fifth street, Phila-delphia, Pa., is a new Maxwell dealer.

delphia, Pa., is a new Maxwell dealer.

New Maxwell dealers include Ray Grimley,
St. Charles, Mich.; Marshall L. Mason, Post,
Tex., and O. K. Auto Co., Burlingame, Kan.
The King Motor Southern Co., recently formed
in Atlanta with headquarters at 253 Peachtree
street, has taken over distribution in the Georgia
territory of the King and the Velie. Frank
Turnipseed and Roy T. Perminter, both in the
automobile business in Atlanta for some years,
head the new company. head the new company.

Among new company.

Among new companies formed in the southeast are the following: Hillsborough Tire Co., capitalized with \$20,000 to handle accessories and tires, at Tampa, Fla.; G. W. Withers, Spring and Walton streets, Atlanta, a new accessory company; Burns-McWhorter Motor Co., capitalized with \$20,000 at Newton, Miss.

The Christian-Wade Motor Co. has been organized at Orlando, Fla., to conduct an automobile agency, with a capital stock of \$25,000. Officers are: A. B. Wade, president; P. H. Christian, vice-president, and J. M. Christian, secretary and treasurer.

The Oteen Supply Co. has been organized with \$25,000 capital at Oteen, N. C., by A. T. Davidson and others, to handle accessories and automotive equipment.

At Statesville, N. C., the Pope Tire & Battery Co. has been formed with \$100,000 to handle tires and equipment. W. L. Pope heads the

Paige-Jewett Motors, Inc., is the name of a new distributing firm organized the latter part of March at Raleigh, N. C., with a capital of \$100,000, by W. E. Smoak, C. C. Disher and George C. Tudor. The company will distribute the Jewett in Raleigh territory.

H. L. Steiert has been appointed Maxwell-Chalmers dealer at Yuma, Ariz.

Manbeck Motor Co., 1110 Locust street, Des Moines, Ia., has obtained a 10-year lease on a new building at 1208 Locust street, which will be remodeled to suit the needs of the company, selling Maxwell and Chalmers cars.

Robischon Motors, Maxwell-Chalmers dealer at Utica, N. Y., is erecting a large garage at Broadway and Lafayette streets.

The Bryant Motor Sales Co. of Asheville, C., is planning the construction this spring

of a new service station and sales building at Patton avenue and Coxe street, to cost about \$\$85,000. The building will be three stories in

height.

Charles G. Atwood, with the Toledo Cadillac Co. of Toledo, O., for some years, has been named sales manager of the Cadillac Co. of Atlanta, according to an announcement by Ralph A. Parker, president. Atwood formerly was vice-president and sales manager of the Atwood Auto Co. of Toledo, Overland distributors, this business being sold to the factory in 1916.

O. B. Hertzog, W. R. Hale, Jr., and W. E. Armstrong, all of Greenville, S. C., have organized and incorporated there a new automobile distributing agency under the name of the Hertzog-Hale Motor Co.

The Language Green Motor, Co. is the name of

The Laney-Gordon Motor Co. is the name of a new dealer firm formed the latter part of March at Monroe, N. C., capital stock being given at \$25,000. The incorporators are C. M. Gordon of Monroe, T. B. Laney and A. M.

The McIntyre-Hamrich Auto Co. has been or-anized and incorporated at Greenwood, Miss., ith a capital stock of \$20,000, as automobile

The Easland Garage, of which John T. Harper is manager, in Great Barrington, Mass., is about to erect a new sales building for the Oldsmobile and Chevrolet. It will be 47 by 140 ft. in dimensions and will embody many attractive features. The present building will be used for

Edward J. Donovan, formerly manager of the Philip D. Powers Motor Co., Inc., of Adams, Mass., has taken charge of the Southern Berkshire field for Hudson and Essex, with head-quarters in Great Barrington.

A branch of the Giddings Motor Co. has been opened for the sale of the Dort and Liberty in Greenfield, Mass., with Harry A. Aldrich, formerly with the Greenfield Oldsmobile Co., as branch manager.

w. H. Hipp of Waxahachie, Tex., has taken over the management of the Dallas Buick Co., retailer and distributor of Buicks in that section of Texas. He succeeds R. C. Langley, who has gone with another concern.

gone with another concern.

Earl Bengston, Bengston Auto Accessory Co., Rockford, Ill., has been made agent for the Kissel in that district. His salesroom is at 132 North First street.

The Johnson Motor Service Co., Davenport, Ia., has filed articles of amendment to its charter and shortened the name to the Motor Service Co.

H. Eddy, Davenport, Ia., has been given Gray car agency in that territory. Gray car

The Miller-Van Horn Co., at 81 East Main street, Columbus, O., Ford dealer, will soon start the erection of a large addition to its building.

The Beck Motor Sales Co. of Toledo, O., has been chartered with a capital of 500 shares, no par value, to buy, sell and deal in motor vehicles.

The Matt Hinkel Motor Sales Co. of Cleve-land has been incorporated with a capital of 200 shares, no par value, to deal in motor vehicles and automobile supplies.

The Center Motor Sales Co. of Cleveland has been incorporated by S. H. Miller and others to buy, sell and deal in motor vehicles and accessories at 1120 E. 105 street.

The Doss Rubber & Tube Co. of Atlanta has been reorganized and started production of the new Doss Imperial cord tire recently announced. Initial capacity on this tire is 1500 tires and tubes daily, according to T. J. Davis, the new president of the company.

The Kirby-Davis Co., North Broad street, Philadelphia, has been appointed distributor of the Anderson Six in that territory, including Pennsylvania east of and including Altoona; southern New Jersey and all of Delaware.

The Braddock Motor Supply Co., Pittsburgh, Pa., conducted by A. H. Blattner and David R. Blattner, has been dissolved. David R. Blattner has sold his interest to J. S. Blattner and the business will be conducted by the two at the same point, 909 Braddock avenue, Braddock.

P. C. Edmundson, A. D. Letchwork and William I. Berryman have organized the Scott Motor Corp. at Washington, Pa., to deal in motor vehicles.

The Republic Motor Co., Inc., of Republic, Pa., has been incorporated with a capital of \$40,000 by Naomi D. Reisinger and John C. Reisinger of Uniontown and Harry Reese of McClellandtown.

The General Motors Truck Co. of Pontiac, Mich., has opened a new factory branch in Pontiac. The branch will handle all sales and service for that territory.

W. J. Dolan, long known in automotive circles throughout Ohio, has been appointed sales manager of the Bryan Motor Sales Co., Maxwell-Chalmers dealer in Lima, O.

Announcement has been made of the appointment of M. S. ("Dick") Niles as retail sales manager for Howard Bros., Inc., Oldsmobile distributor at Jacksonville, Fla.

The Butte Motor Truck Co., Oldsmobile dealers at Butte, Mont, has just taken possession of new headquarters, one of the best in the city.

M. G. Palmer, manager, reports the prospects for 1923 summer business very encouraging.

for 1923 summer business very encouraging.

The Hibbard-Robinson Co. has been organized in Atlanta and has taken over distribution in that territory of the Chalmers and Maxwell, succeeding Joseph G. Blount, who has distributed these cars in the Atlanta territory for many years. Atlanta salesrooms and service station are at 385 Peachtree street. J. M. Hibbard, president of the company, for the past seventeen years has been president of the Automobile Crankshaft Corporation of Detroit; he will retain his interests in this company but will sever active connection to devote his full time to the Atlanta distributorship.

The Chalmers Six is being distributed in the

The Chalmers Six is being distributed in the femphis, Tenn., trade now by the Tri-State fotor Sales Co. at 416 Monroe avenue.

The Tarbell-Watters Co., jobber and dealer in automotive parts and accessories in Springfield, Mass., has awarded contracts for a new building to cost \$225,000, to be located on a corner site. Practically all the first floor and basement of the five-story structure will be used for the company's business, with 100 ft. frontage of display windows.

The recently formed Stamford Peerless Motors of 564 Atlantic street, Stamford, Conn., has taken on the Peerless eight.

on the Peerless eight.

Recent additions to dealer organization of the Auburn Automobile Co. of Auburn, Ind., are announced as follows: J. W. Smathers, 359 Peachtree street, Atlanta, Ga.; Auburn-Kokomo Co., 117 Union street, S. Kokomo, Ind.; A. & J. DeGrand Motor Co., 1700 Ludington street, Escanaba, Mich.; Ernster & Mayrose, Remsen, Ia.; Losher & Hodgert, Eighth and H streets, Modesto, Cal.

The Triangle Mater Co.

Modesto, Cal.

The Triangle Motor Car Co., Elgin, Ill., has removed from 36 River street to a new home at 141 Grove avenue, due to the necessity for larger quarters. The company is composed of three brothers—Charles, George and Emil Jenny. They gave up farming near Elgin last July to open a garage and sales agency. They became distributors of the Chevrolet car and in nine months sold 175 cars, of which 80 were 1923 models sold since Oct. 1.

NORTHERN RUBBER INCORPORATES

AKRON, Ohio, March 31-The Northern Rubber Co. has been incorporated for \$450,000 by L. J. Schott, former president of the Amazon Rubber Co., and R. W. Kent, former vice-president and Canton manager of Republic Rubber Co. The new company has purchased the plant of the defunct Biltwell Tire Co., for \$200,-000. The plant is fully equipped and will be in production in two weeks. The capacity is 600 tires and tubes daily.

A. H. SWAYNE HEADS COMMITTEE

WASHINGTON, March 31-A. H. Swayne, vice-president of the General Motors Corporation, has been appointed chairman of the committee on "Relations of Highways and Motor Transport to Other Transportation Agencies," which will represent the automotive industry in the general transportation survey conducted under the auspices of the Chamber of Commerce of the United States.

FRANKLIN RECORD SHIPMENTS

SYRACUSE, N. Y., March 31-"So far this year we have shipped three times the number of cars shipped during the same period a year ago," states H. H. Franklin, president of the Franklin Automobile Co. "Every indication points to the fact that this will be the biggest quarter in our history. Our present production of 60 cars daily is the largest

The READERS CLEARING HOUSE Questions & Answers on Dealers Problems

Questions Of visivers on Dealers

Information on Storage Batteries

Q—We wish to ask for some information on storage batteries. In repairing an old battery, should it be charged or discharged before taking apart? If discharged before tearing down, to what gravity should it be reduced? Can the acid solution be used again, or not? When the plates are taken out, should they be left dry or should they be put in a jar of water, or should it be water and acid? How strong should this solution be? If some of the old plates can be used, is it well to use them over again or should new ones be put in? Are rubber separators better than wood? How strong should the solution be for storing separators? How strong should the electrolytes be made? Is 1200 gravity about right? Is it better to mix acid and water in a jar and let it cool before it is put into battery? Is it all right to start charging at 5 amp. and finish at 3 amp. Give the correct rate for charging old and new batteries. What is the cheapest way of charging? We have an electric line running past the place we are building and this line is 110 volts D. C. Would it be cheaper to have a motor generator or charge by some other method? We wish to charge about 10 or 12 batteries at a time.—H. J. Berth, Sheboygan, Wis.

1-We will answer a few of your questions in detail and refer you to a good storage battery book for the rest. If you get into the storage battery repair business you will constantly have little points coming up and will want a good book to refer to. The condition of the battery is of no consequence when opening it up. When the plates are pulled out of the cells, however, pieces of cardboard should be used to temporarily act as insulators in case any of the plates seem to be touching each other due to the wood separators being rotted away. The plates may then be put back in the same old solution and temporary connections made so that they may be charged. The torn down battery thus temporarily reconnected should then be put on the line and brought up to a fully charged condition before the plates are worked on. This makes it possible to bring the negative up to a recharged condition by using the old positives even if they are in such a condition that they will fall to pieces when the separators are removed. The old acid found in the batteries should not be used again except for the process above described.

It is rarely necessary to mix acid in a battery shop, as it is better to buy electrolyte of the proper gravity. In many battery shops, 1400 acid is used, as it is usually put into batteries where new separators have been installed. Under these circumstances, the separators are full of water and the water neutralizes the acid to a certain extent, bringing it down to about 1300, which is approximately right for a charged battery. However, if you ever have occasion to mix

The Readers' Clearing House

 T^{HIS} department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

acid and water, always pour the acid into the water, never the water into the acid. A chemical action takes place and there is likely to be an explosion or at least a scattering of the acid. If you pour the acid into the water you have at first a very weak solution, as it is mostly water, while if you do it the other way you have a strong solution to start with, as it is mostly acid.

Charging rates vary with the number of plates and the condition under which the charge is carried on. In some cases three amp. might be sufficient and in other cases 50 amp. might do no harm, so that you have to study all the conditions before you can say what current is exactly right.

In regard to a method of charging, would suggest that you make sure that the line is really direct current. If so, your problem is easy, as all you need is a rheostat of some sort to limit the current. Various battery equipment concerns can supply you with a device of this kind.

To Line Up Main Bearings

Q—We would like to know how to line up the main bearings of an engine. We want to find out whether the center main bearing is too high or too low and also whether the front and rear bearings are the same distance from top of cylinder, and also to find out if crankshaft fits down farther on one end than on the other. If the bearings are not the same, will this cause the piston to wear on one side?

1—If the crankshaft is not at right angles to the cylinder bore and parallel with the camshaft bearing, it will cause noisy operation and will also cock the pistons in the cylinders and tend to cause over oiling and to perhaps rapid wear on the pistons. If you wish information as to the easiest way to determine whether all three bearings are touching the crankshaft, that is, to detect a high or a low bearing we would advise that you read an article printed in the November 2 and November 9 issue of Motor Age. The title of this article is, "How Should Engine Bearings Be Fitted."

Perhaps the quickest way of determining whether the crankshaft is or is not parallel to the camshaft or to the machined portion of the crankcase is to first scrape the connecting rods on a true mandrel, then mount the connecting rods on the crankshaft and the crankshaft into the case. If the connecting rods line up with the machined surface of crankcase, that is, if they are at right angles to the cylinder walls it is conclusive proof that the crankshaft is parallel with the camshaft or the datum point on the cylinder block or crankcase in the case of separate block construction.

2—Advise where we may secure some real light piston pins for this engine.

2—Name of concerns which will make special pins to your specifications will be supplied by letter.

WHEN A TRACTOR CLUTCH STICKS

Q—Tell us what to do when the clutch in a Fordson tractor slips. Should it have new springs put in or an extra plate in the clutch, or both?—Heye Heeren, Flanagan, Ill.

The recommended procedure is to replace both the clutch plates and the springs. The greatest cost of an overhaul job is the labor, so that it does not pay to try to use old parts when trouble with a slipping clutch is experienced. The plates should be examined to see that they are not bent when installed, as this may cause the clutch to fail to release properly.

A Two Story Garage with Ramps

Q-On account of our being on the verge of erecting a new building, we are taking this privilege of asking you to submit sugestive plans to comply with the following specifications.

Size of lot we wish to build on is 123 by 95 ft., situated with the long side facing the street which will be better understood when referring to the drawing we are herewith inclosing. We would like to have your plans for a two story building, structure to be of steel, con-crete and hollow tile, with some kind of modern roofing.

The purpose for which this building is to be used is as follows: First floor, showrooms for sale of new and used cars, parts and accessory department, general storage, wash rack and light service work. Second floor is to be used for repair shop, paint shop, trim shop and balance of room to be used for stor-Our contractor has suggested that the lower floor be divided into two 50 ft. and one 23 ft. rooms, but we are not very much in favor of cutting same up this way.

Would appreciate statement concerning your experience with elevator versus ramp. Also as to the proper material to be used for floors in sales and service rooms, as to appropriate locations for necessary driveways in and out of building. In fact, anything you can give us in the way of criticism or suggestions on this matter will be greatly appreciated.— Princeton Hudson-Essex Co., Princeton,

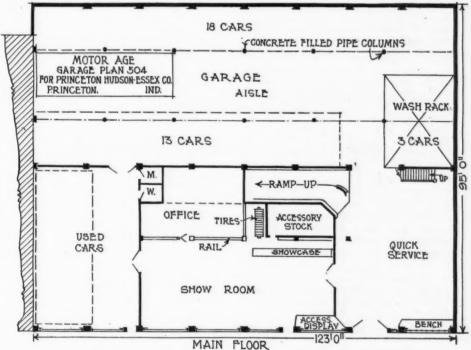
We have laid out a two-story building along the lines you suggested and agree with you that the contractor's suggestion is not the best arrangement.

As regards the use of elevators or ramps, there is a great difference of opinion on this matter. While some dealers will have nothing but ramps, others are of the opinion that elevators are the thing. We have laid this plan out for use with ramps and believe that in cases where there is a considerable amount of storage, ramps are really the most ecoonomical and expedient means of getting to the second floor. If your second floor were to be used for service only, we would probably advise the use of an ele-

We would suggest concrete-filled pipe columns for use in the garage, as these are very strong and rigid and at the same time use very little space. Fourinch columns, or possibly five inches. would be ample enough.

There are many types of floors that are suitable for salesrooms, among them being hardwood, tile in various colors and types, composition floors, such as Kellestone or Asbestone. There are any number of beautiful and serviceable materials and it is generally a question of expense rather than service, as they are all good. Wood blocks are being used for service rooms. Some are laid on cement foundations, but most shops are content with

NARROW STORAGE - 15' 3" O.C--15' 3" O.G.+ PAINT GARAGE SKYLT SKYLT STORAGE TOILET DOWN-DAMP COUNTER SKYLT. STOCK ROOM CARS IN REPAIR MACHINE EQUIPMENT BENCH SECOND FLOOR



cement alone. Asphalt is also used to some extent.

Your sketch would indicate that you wish to use the 9-ft. space in back of the office building as an exit or entrance. We believe, however, that this would be rather impracticable because it would be pretty hard to get even an 8-ft. doorway. On account of this space being so far back in the corner, there will be considerable loss of storage space by reason of the necessity of making a straight run in order to get through this narrow doorway.

Architectural Service

Architectural Service, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things,

we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected they will be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop. How much of an accessory department is

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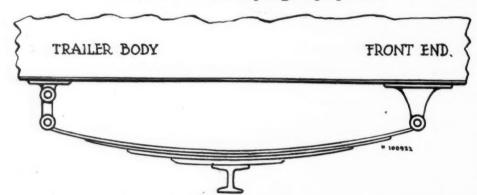
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A Trailer for Camping Equipment



Q—I have undertaken to build a two-wheel trailer, using two wire wheels from an Overland four. Would like to have the box about 7 ft. long. It is to be used behind a model F. A. Chevrolet Baby Grand to carry an average of 400 lbs. in the shape of camping equipment. Kindly give your opinion as to the size of axle we should use, also the length of springs, and where the axle should be placed, that is, whether back or forward of center and how much.

Also advise at what distance the trailer should be carried behind the car and any other information that might be useful.—George T. Graham, Halifax, N. S., Canada.

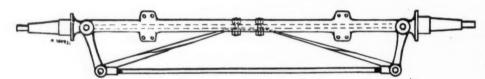
We have two suggestions to offer, the first one being that you use a standard

the spring attachment which is also il-At the front end of the lustrated. spring you should have a mounting bracket capable of taking the driving strain while at the rear end a shackle should be used to allow for the change in spring length as the spring deflects. The axle should be so located that there is a slight tendency for the trailer to tip over forward. In use it will at times be necessary to disconnect the trailer from the car, for example, as when turning around in a narrow road. Under these circumstances it would certainly be inconvenient if the trailer should tip

spinning, due to the fact that the transmission was lubricated with grease. Oftentimes the grease would work into the clutch housing and adhere to the clutch facing, thus causing the clutch to drag, with consequent gear clashing. This was remedied at the factory by so constructing the power plant that the transmission received its lubrication from the engine lubricating oil.

The same principle can be applied to

the earlier Overlands, which used grease lubrication. It is necessary to remove the plug screwed into the transmission case, which will connect the clutch housing with the transmission housing. Before doing this, remove all the grease from the transmission housing. Pour about one quart of oil into the transmission after you have thoroughly drained the old grease and washed it with gasoline. Do not become worried if the transmission does not show a great amount of lubricant when the engine is not running, as it receives its full quota of oil when the engine has started to revolve. With the engine at rest the transmission will show not more than one quart of oil in the case, but this should be no cause of worry, as adequate lubrication is supplied when the engine is running.



front axle for your trailer. We have accordingly shown a front axle with the rod in place and strap iron used to keep the wheels from turning. While such an axle has more strength than you really have to have, it would probably be cheaper in the long run, for you can pick up one at some wrecking concern and will have the spindles already prepared to take the bearing for the wheels. The other suggestion is in regard to

over backward. In the forward direction the trailer can tip over until it rests on the tongue which will be securely bolted to the body and will be used for towing the trailer.

We have no definite information as to the best distance to place the trailer behind the car but believe it should be as close as possible and still not allow the trailer to strike the car when turning a sharp corner.

AIR GAPS IN FORD MAGNETO

Q—Let me know what air gap is recommended between the coils and the magnets in a Ford magneto when rebuilding the engine with new main bearings. This question refers to car, truck and tractor engines.

1-The recommended space is 1/32 in., but we have a very good subscriber who claims he has good results by setting them closer, in fact to the point where the magnets almost rub. The thrust of the clutch spring is in such a direction that it tends to increase this gap, so that wear will usually occur in such a way that the gaps become larger. This is apparently our subscriber's reason for setting the gap as small as possible to start with. The rear main bearing locates the crankshaft, as far as end play is concerned, while shims in behind the plates which hold the coil are used to regulate the air gap after the rear main bearing has been fitted.

2—About how much would this gap increase before it would cause trouble?—J. M. Thomas, Anaheim, Cal.

2—The exact amount is hard to state. One way of checking, however, is to jack up one rear wheel and leave the emergency brake lever in the down position so that the clutch is engaged. This allows the magnets to pull closely up to the field poles. Now crank the engine, and in most cases it will be found to crank easily. Then stop the engine and pull the emergency brake lever up so that the clutch spring will widen the gap. If the engine is now hard to start it shows that the trouble is due to end play in the crankshaft, which increases the air gap abnormally.

GEARSET IS NOISY

Q—We have a 1918 Liberty with Detroit gearset and when pulling in low speed this gearset makes quite a noise. The teeth appear to be in good condition and new bronze bearings have been put in, but the low speed is still noisy. When the bearings were installed we noticed that on one shaft the surface was slightly grooved. Could this be the cause of the noise?—J. E. Dye, Fort Wayne, Ind.

Trouble of this nature is due either to a sprung shaft or to bearings which are out of alignment or to gear teeth which are worn. From your description, we believe that the greatest possibility is that the new bronze bearings which were installed were not perfectly aligned. When put in at the factory they are doubtless line reamed with a reamer which goes through both ends of the case, so as to assure perfect alignment.

The grooving of the shaft will possibly

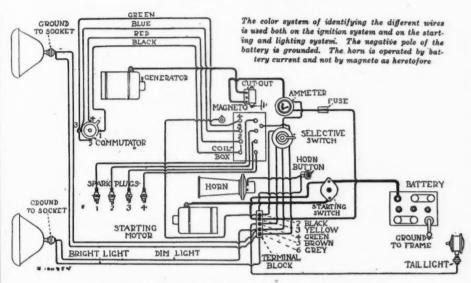
have an indirect effect in causing rapid wear on the bearings or play in one or both ends of the shaft, which will doubtless cause some noise. Any condition which produces imperfect meshing of the gear teeth will make the gears noisy. In many cases it is considered better to tolerate a certain amount of noise than to spend the money necessary in trying to eliminate it, as efforts in this direction are not always what they should be.

CAUSE OF BROKEN GEARS

Q—In the first few baby Overlands put out they had trouble breaking gears. We have been told that this was caused by suction in the clutch that can be remedied by drilling a hole somewhere in the case. If this is true, where should this hole be drilled?—R. M. Olmsted, Bloomington, Wis.

The first series of Model 4 Overland cars were sometimes addicted to clutch

Wiring for 1919 Ford



Wiring of 1919 Ford car with starting and lighting system

Q-Publish wiring diagram of 1919 Ford coupe.

1-We assume that you refer to the 1919 car equipped with starting and lighting equipment and accordingly show a diagram of this system. However, if you require a diagram in which the starting and lighting was not included you will find one in the June 29. 1922, issue of Motor Age. The diagram as given is substantially the same as the cars use at present. One difference is that the cutout is now usually on the generator, but this does not affect the nature of the circuit. You will also find today some cars that have direct current horn using current from the battery. In the diagram it is not perfectly clear whether the wire from the horn to the horn button and then to the junction block actually connects to the magneto circuit or to the battery circuit. It is, accordingly, possible to connect it either way, depending on the type of horn being used.

2-Advise what make of piston rings would be best to install, as I have the engine all apart.

MOTOR AGE does not make recommendation as to make of parts to be used.

3-What clearance should be allowed to pistons?

3-.004 inches. In other words, the cylinder should be .004 inches greater in diameter than the piston.

4-What is the necessary clearance between magnets and field coils?

4—The recommended clearance is 1/32 in., although it can be closer if desired, the only requirement being that the magnets do not hit.

5-Would a circuit test of the field coils be sufficient to tell if they are O. K. for installation in the engine?

5—A circuit test will give some idea and you should get about 12 amperes when connecting a 6 volt battery from the terminal to the frame on which the coils are placed. Another test would be to use 110 volt test line with a lamp in series testing from the live terminal of the coil to the frame in order to see if the coils are grounded. The lamp should not light up and if it does it shows a ground exists.

6—What would be the best material to use for insulating the coils, as three of them are exposed?—H. M. Mazzoin, West Springfield, Mass.

6—The coils should be taken off and cotton tape used to wrap around them. The tape should then be saturated with shellac or varnish and allowed to dry.

BUILDING A RACING CAR

Q-We are building a racing car from a 1917 Super Six Hudson. What light weight pistons would you advise me to use, also the proper clearance to give these pistons.

1-This information will be given by

2—What oiling system would you suggest is the best and surest for this type of engine?

2-The best system for this engine or any other engine would be a hollow crankshaft force-feed system of lubrication. The hollow crankshaft system will cost considerable money to install, and if the car is to be used in races not longer than 50 miles in length, we believe that you can safely depend on the present lubrication system. The oil pump, of course, should be set to full stroke. We would also advise that you secure a shorter pump control lever, which will increase the ratio of pump feed. This lever is mounted on the lefthand side of the engine and is controlled by the throttle. Shortening the lever will open the pump wider for a given throttle opening than the stock length of

3-What gear ratio would you advise

to install for half mile dirt track racing, also for mile racing? Do you think 3½ to 1 is too high for mile racing The size tires I will use are 32x44.?

3—The most suitable gear ratio, of course, can be determined only by actual tryout, at which time the engine characteristics will be learned. Assuming that the engine operates without great vibration at 3,000 r.p.m., you could use a 3% to 1 ratio for mile track, which should give a maximum speed in the neighborhood of 75 to 78 m.p.h. For half-mile tracks we would recommend the regular 41/11 to 1 ratio, which can be secured from the Hudson Motor Co.

4—Do you think the following is a good oiling system to use? I would fill oil base to a level so that the connecting rod bearings would dip half way in the oil and to keep the oil down so the spark plugs would not foul, I would use a wiper ring in the upper groove of the piston; I would also change the oil pump stroke to the fullest length.

4—This system should give good results for short-distance racing, as outlined in the previous questions. Two piston rings should be sufficient to maintain the compression in this engine. By omitting the third ring the friction will be reduced to such an extent that there will be an appreciable gain in revolutions.

5—We have the chassis cut down and have a very nice appearing body on it; now, what color would you sugest will make this racer look the best; of course, we want to get away from the usual gray or white colors.

5—The choice of colors is entirely a matter of taste and what appears handsome to one person may be distasteful to another. Very striking color is gold paint applied to the body, that is, gold bronze with a coat of varnish over it. Another combination that was seen at Indianapolis last year was dark brown with red stripes. Blue and gold is also a good standard color combination.

6—If there is anything else you can suggest in helping me build this racer I wish you would inform me of it.—Ben Hentz Auto Repair, Milwaukee, Wis.

6-We have previously mentioned using hollow crankshaft lubrication. Another change that would show an increased speed is the installation of two carbu-Two carbureters may be inreters. stalled by removing the present carbureter and closing the inlet in the cylinder at that point. Then remove the two plugs on either side of the central inlet to the port passages of the block and fit one carbureter to each of these ports. The Ira Vail and Ralph Mulford 300-in. Hudson racing cars were thus equipped. It is easier to thread the casting at each port and use a nipple, which will have a flange at its end, than to attempt to face the casting and drill for studs. Two Hudson carbureters were installed on the engines referred to. The valve spring tension should be increased by inserting washers between casting and end of spring; 1/4 in. thickness is sufficient.

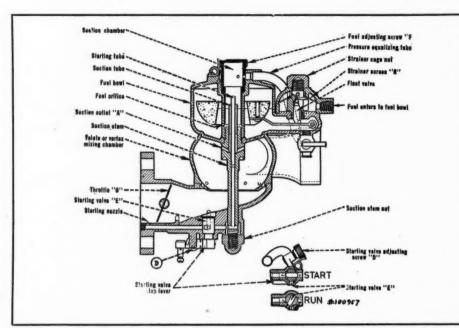
Truck Governor Adjustment and Throttle Controls

Q—Explain the adjustment of the governor and throttle controls on an International truck, model G. Engine will not idle, but races, as the throttle sticks, and when adjusted butterfly will allow engine to idle but will not open.

1-This trouble is probably due to trouble in the carbureter proper or in the controls from the governor arm to the carbureter. Would suggest that you disconnect the carbureter control rod from the governor arm and then speed up the engine. If the arm moves with the engine speed it indicates that the governor is operating correctly. When your engine is decelerated the arm should return to the position it occupies normally with the engine idling. From this point it would be very easy to trace the connections and determine where the trouble is located. Look out for a seized butterfly shaft in the carbureter or control arms that are adjusted so that they are at an improper angle. Your diagnosis would indicate friction and we would advise that you give considerable attention to this detail.

2—Explain adjustment of model E Ensign carbureter on this truck.

The model G International truck has a model G Ensign carbureter and we do not know of a carbureter of this make which is designated as model E. Fig. — illustrates the carbureter as used on this truck. Its principle of operation is as follows: The fuel enters and passes upward through screen B, and downward through the float-controlled needle valve into the float chamber. The fuel level is maintained 1/32 of an inch below the top of suction tube, which opens through holes "A" at its lower end into the centrifugal chamber. The suction tube



is surrounded by a larger tube, into which fuel enters through small fuel hole.

The effective opening of this hole is controlled by the gas-adjusting tube shown in solid black, which can be screwed up and down by its knurled head. This tube performs the function of the usual gas-adjusting needle valve. A compensating air tube is connected to the interior of the gas-adjusting tube through the automatic valve which lifts when the air speed through the carbureter becomes high enough, and lowers the vacuum in the gas-adjusting tube, preventing the formation of too rich a mixture.

Adjustments

Before starting engine, screw fuel adjustment "F" down to closed position and

then open it 11/2 turns. If the engine is cold set starting valve "E" wide open by pulling steering post control up, bringing the finger "H" in contact with the stop. This causes a rich mixture which is necessary for starting when cold. Set throttle at about the ¼ open position. Start the engine and run with retarded spark, and open throttle to get higher motor speed, and when the engine is warmed up push steering post control back to running position. Now adjust high speed mixture by using screw "F" just as you would a needle valve, adjusting, to obtain the highest motor speed with the least possible fuel.

After high speed mixture is adjusted, adjust idling speed with the screw on the throttle stop, and then adjust "D" to get the proper idling MIXTURE, turning clockwise for rich idling mixture and counterclockwise for thin idling mixture. Be sure that the screw "D" is touching the stop while adjusting. The top of the cork float should be set 7/16 of an inch below the top of the bowl for the correct fuel level.

3—Explain the easiest way to disassemble the clutch on a model 3018, No. 182325. Nash two ton truck. Give the adjustment of this clutch.—Alec Leonard, care Standard Oil Co., Iron Mountain, Mich.

3—Illustration of the clutch used in the two ton Nash truck is shown in Fig. —. To disassemble the clutch and housing, the following information is supplied from the Nash instruction book: First, remove gear shifter case, which is done by disconnecting the hand brake rod, transmission operating rods and the transmission gear shifter case screws, of which there are four.

1-Remove universal joints.

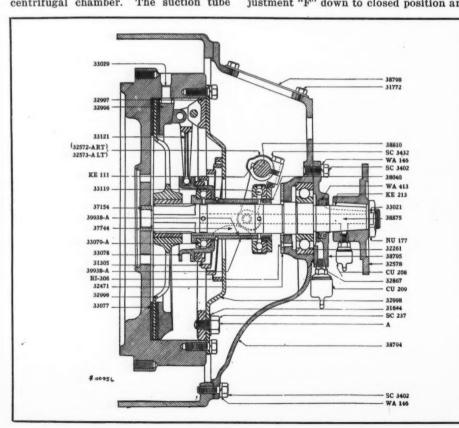
2—Remove clutch housing cover plate, No. 38798.

3—Use a long 3 in. socket wrench and loosen two screws, FC. 3432, holding throwout shaft levers in place.

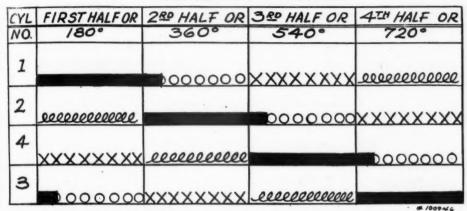
4—Release right and left throwout shaft levers, Nos. 32572A and 32573A.

5—Remove from throwout shaft two keys, Ke-111.

Continued on next page



Effect of Broken Piston CRANKSHAFT TRAVEL



BLACK LINES DENOTE INTAKE VALVE OPEN INTAKE VALVE ON AVERAGE ENGINE X = FIRING STROKE REMAINS OPEN ABOUT 25° PAST O = COMPRESSION STROKE LOWER DEAD CENTER. IL= EXHAUST STROKE

Q-We have just recently had a somewhat paffling experience with a Model "N" Continental engine. This car was pulled into shop and we are unable to start engine. We proceeded to check up valve timing, ignition and carbureter found all O. K., but car didn't seem to found all O. K., but car didn't seem to get fuel and would run only a few seconds by priming. We then tested the compression and found that No. 4 cylinder had none. Dropped the pan and removed broken pistons from No. 4 cylinder. The head of the piston was broken from the top ring up and was completely gone from the top ring upwards. What we would like to know is what was the reason that the three remaining cylinders would not suck in the charge of gas and would not suck in the charge of gas and why wouldn't the engine start and run on three cylinders.—Ray Bayne, Omaha.

Cylinders No. 2 and 3 would not fire under these conditions, owing to the fact that the broken piston in No. 4 would neutralize the vacuum created by the suction stroke of piston. The inlet valve on the average engine remains open from 20 to 35 degs. after lower dead center, which would leave No. 4 inlet valve open during the suction stroke of Nos. 2 and 3 cylinders. Theoretically, the broken piston in the No. 4 cylinder should not affect the operation of No. 1, as the inlet valve and the exhaust on the No. 4 cylinder is closed during the inlet stroke on No. 1 cylinder. It is possible, however, that the throttle was not sufficiently open to allow No. 1 cylinder to carry the load of the remaining three cylinders. The sketch explains graphically the inability of cylinders No. 2 and 3 to draw in a charge.

21-Remove brake pedal.

22-Remove clutch throwout shaft lever screws.

23-Drive clutch throwout shaft, No. 38810, out of housing, removing clutch throwout shaft lever, and make certain that two keys. Ke-111, are first removed.

24-Before replacing, housing must be reassembled, with the exception of items 1 to 8.

25-Enter the clutch shaft and secure its position in the flywheel bushing and

After housing has been bolted up, adjust the throwout lever so that they bear equal distance from the shaft on either side of clutch shaft, inserting keys be-

fore moving them and tighten screws SC3432. The above is applicable when the clutch and transmission housing are removed as a unit.

To disassemble the clutch proper. Operation No. 2. Proceed as follows:

1-Place two hardwood blocks 11/2 in. square between clutch throwout sleeve thrust bearing, No. 33119, and clutch cover. No. 32998.

2-Remove 12 clutch cover screws, No.

3-Remove clutch cover complete.

4-Remove clutch and adjusting ring, No. 32996.

5-Remove three clutch ring pins, No. 33029 (drive inward).

6-Remove clutch facing, No. 33077.

-Remove clutch drive plate, No. 32999

8-Remove clutch facing, No. 33077; if worn, replace with new.

9-Remove clutch shaft front bearing, No. 37154.

Before reasembling, examine all bearings, replacing when necessary.

TEST FOR PISTON SLAP

-We have a Dodge touring car, 1918 when have a Dodge touring car, 1916 model, in which we installed new Inland oilless rings in June, 1922. After this car had run about 800 miles, it developed a noise like a loose tappet adjustment, but by tightening the tappet adjustments we got no results.

We then took the old pistons out and lapped in .010 oversize pistons. The old pistons weighed 47 oz. each. The new pistons weighed 26 oz. each. We also inpistons weighed 26 oz. each. We also installed new piston pins, new push rods, new push rod guides and new D. & B. silent timing gears. We also tightened all main and connecting rod bearings and lined rods. Now while idling there is no noise of any kind, but as soon as it is given the gas the same noise develops, especially on hills. As I said before, it sounds like loose tappet adjustments. Can you tell us what would cause this noise and what you would sugest as a remedy?

—J. S. Calvert, St. Louis, Mo.

1-We have been informed by the local service station that the engine should be tested for piston slap. It is possible that the pistons were installed with too much clearance and this engine behaves peculiarly when equipped with loose fitting pistons. Would suggest that you use a sounding rod or any instrument that will enable you to conduct engine sounds, such as a sonoscope. By using this method of testing, you should be able to confine the noise to the cylinder causing it, and from then on it is a matter of elimination. When the noise has been traced to any one cylinder, it is advisable to remove the piston in that cylinder and micrometer the cylinder and piston. If you are unable to detect the cause of the knock after you have confined the noise to one cylinder, communicate with this office and we shall offer further suggestions. Another possibility which comes to mind is that the starter chain is not properly adjusted, in which case the noise produced would be very similar to that which you describe, although probably slightly duller in tone.

BUICK 1917 VALVE TIMING

Q-Tell us the valve timing on a Buick D-35, 4-cylinder, year 1917, and what speed should they make.—Painter's Garage, Darlington, Ind.

1-The valve timing for the model 10, 32, 34, 33 and 35 is as follows: Inlet opens 3/32 of an inch past upper center. Inlet closes 17/64 of an inch past lower center, exhaust opens 21/32 before lower center, exhaust closes 1/16 past upper center. The tappet backlash should be .010. The dimensions given are to be measured on the rim of the flywheel. The average speed of the D-35 is 50 m.p.h.

Continued from preceding page

6-Remove 10 clutch housing screws, % in., No. SC3402.

7-Remove housing assembly.

8-At this time the clutch can be removed (see operation No. 2 for a complete disassembly).

9-Remove universal joint companion flange nut, No. NU177.

10-Remove universal joint companion flange nut lock, No. 33021.

11-Remove universal joint companion flange, No. 32578.

12-Remove universal joint companion key, Ke-213

13-Remove three clutch shaft rear bearing retainer screws, No. SC3402.

14-Remove clutch shaft rear bearing retainer, No. 38795. 15-Remove clutch shaft rear bearing

container gasket, No. 32867. 16-Remove clutch shaft rear bearing,

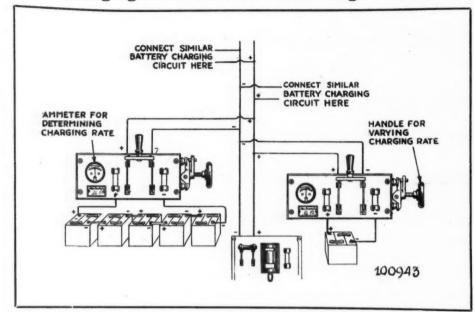
No. 32261, and clutch shaft, No. 38875. To remove bearing, press out shaft.

17-Remove clutch pedal, No. 31397. 18-Remove clutch pedal adjusting

19—Remove clutch pedal adjusting

hub T, No. 9, Woodruff. 20-Remove clutch throwout shaft and screw.

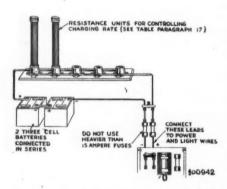
Charging Batteries with Delco Light Plant



Charging automobile storage batteries with an adjustable rheostat and a 32 volt farm lighting outfit

Q-We have a Delco Light plant, 32 volts, and would like to have information regarding storage battery charging from this plant. What kind of resistance units could be used so as to vary the charge and would it be necessary to have a voltmeter in the charging circuit? Give switchboard layout and any information that would be of value in laying out a charging outfit.—W. B. Johnson, Norris, Mont.

Three illustrations are given, one



Charging automobile storage batteries with resistance units and 32 volt farm lighting outfit

showing a method of charging batteries by means of simple resistance units placed in ordinary lamp sockets. Another illustration shows a method of using a variable rheostat where the charging rate may be more accurately controlled. The third illustration gives the approximate charging rate obtainable with various number of batteries and from one to four resistance units.

In connecting up charging circuit, the other circuits of the lighting plant should not be altered. An extra circuit, however, should be connected from the main line going to battery and a switch with fuses installed as shown in the illustration. It is then possible to charge either when the set is running or

when it is not running, although it is very inadvisable to try to charge batteries unless the main storage battery which comes with the set is fully charged to begin with. The greatest efficiency is obtained when five batteries are being charged at once and the process is least efficient when charging only one battery at a time.

The illustration which shows the resistance unit does not show an ammeter, but one could be used; for example, an ammeter off of a Ford car could be installed by cutting the circuit from the switch to negative battery and inserting the ammeter so that the charging current would have to go through this meter. In your question you refer to the use of a voltmeter. We believe this is a mistake, as an ammeter is about all that is necessary in connection with charging batteries. A 3 volt scale voltmeter, however, is a good thing to have to check each individual cell at the end of the charge run to see if it comes up to approximately 2.5 volts per cell. Information as to source of supply on resistance units and also the adjustable rheostat with panel and ammeter will be given by separate letter.

In connecting the battery or batteries to be charged to the line, it is essential that the positive end of the string of batteries be connected to positive line, and the negative to negative. If this condition is reversed an awful short will

Cells to be Charged

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Resistance Units to be Used

1 1 1 2 2 2 3 3 3 3 4 4 4 4 4 4 4

Approximate Charging Rate—Engine Running

523 5.5 5 8.5 7.5 7 9.5 8.5 7.5 8.5 7.5 625 5 4 3

Approximate Charging Rate from Delco-Light Battery

4.5 425 4 7 6.5 6 8 7 6 7 5.5 4.5 3 2 1

Table of approximate charging rates obtained with resistance units

result. If it is difficult to tell the battery polarity it can be determined by putting some acid or salt water in a jar and dipping the two battery leads into the jar. The negative lead will bubble the most.

KNOWLEDGE OF ELECTRICAL TROUBLE SHOOTING WOULD HAVE SAVED THIS TROUBLE AND EXPENSE

Q—About a year ago a man came to my garage to have a starter put on his Ford car. I installed a starter generator and a new battery. Everything ran fine for about 3 months when the battery became discharged. I thought nothing of this, so I recharged the battery and it came up fine after a few hours of charging. From this time on the same owner came back about every week to have his battery charged. I finally became disgusted with the car and installed a new set of wiring and replaced his old battery with a new one. Also put on a new generator relay. The generator charges at the rate of 18 amperes per hour.

All of this did not help the car in the least. In about two weeks he came back with his generator not charging, so after a little search for the trouble I found the armature to be burnt out. After installing a new armature, the trouble was overcome. What do you think was the cause of all this trouble?—Marvin C. Heiser, Fort Wayne, Ind.

1—The practice of replacing various parts of the electrical system without actually knowing that they are defective is the source of a great deal of expense and annoyance both to the shop and the customer. Study of electrical systems and methods of trouble shooting would make this practice unnecessary.

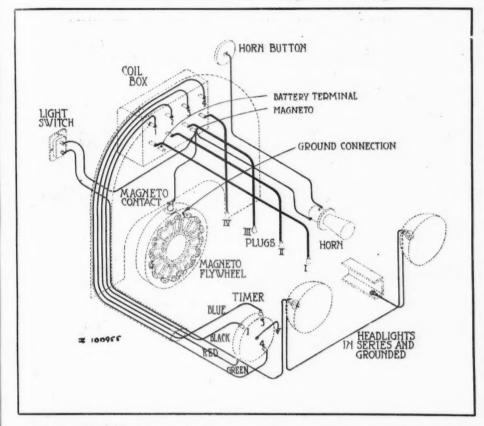
It would be our opinion that the armature was shorted in the first place in spite of the statement that it was charging 18 amperes. If it were really true that the generator were charging the battery at the rate of 18 amperes, it would not be possible for it to become discharged so quickly. As nearly as we can determine, the battery, wiring and relay were unnecessarily replaced.

BUICK TWO CYLINDER IGNITION

Q—We would like to know if the Buick Motor Company ever built a two-cylinder engine, model F, having an ignition system that gave a spark at both plugs at the same time. If so, give the year and type of ignition system used.—L. B. Larson, Pasadena, Cal.

This system was a battery system used on a two-cylinder car before they started to use model numbers, and only a few of these cars were built. A vibrating type coil was used and a timer was mounted on the crankshaft. The two ends of the secondary winding of the vibrator coil went to the spark plugs and produced sparks in both cylinders at once. One cylinder, of course, had dead exhaust gas in it and consequently there was no effect there, while the other cylinder had a fresh charge which was fired by the spark. Later on the timer was removed to the camshaft and still later a magneto was used, firing only one plug at a time.

To Check Stearns Knight Timing



Q—Advise the sleeve valve setting on a 1917 Stearns Knight engine. The engine runs hot. The intake port does not open until the flywheel is 3½ inches past dead center. We can get no compression in No. 4 cylinder. The intake sleeve was cracked and later welded and scraped out to fit the junk ring properly, but we still get no compression on the No. 4 cylinder.

1—The timing on a 1917 Stearns engine is best checked by observing the opening of the exhaust port. The exhaust should close exactly on top dead center. To check this condition, it is well to remove one of the large plugs at the right side of the engine, these plugs being in the No. 2 and No. 3 cylinders. Assume, for example, that we remove the large plug in the No. 2 cylinder, it is then possible to use a piece of paper to tell when the exhaust closes. First scrape all carbon away from the edge of the opening in the sleeve and then turn the engine in the normal direction until the opening starts to close. By means of the paper inserted in the opening it is possible to tell just when the paper is pinched, which is the instant at which the valve

Having determined this point, observe carefully the position of the starting crank handle and mark it carefully on the front of the radiator. Now remove a spark plug and by means of an iron rod about ¼ in. in diameter determine the action of the pistons. If further motion of the starting crank causes the plston to move up it shows that the timing is too early and if it is found that the piston is already moving down, then the timing is too late.

The marking of the starting crank position on the front of the radiator

makes it possible to turn the engine nearly two revolutions and then approach the position at which the exhaust openings close. In this way the piston position at the time of the closing of the exhaust can be accurately determined.

If not correct, it will be necessary to change the camshaft position somewhat by means of the front end timing chain. To get at the front end timing chain, it is necessary to remove the plug which is in the starting crank opening. This has a left hand tread so it should be turned to the right to remove it. It is also necessary to remove the oil pump and the front cover of the crankcase. When replacing the oil pump it should be primed; that is, filled with oil through the plug in the upper portion before the engine is started so that it will start pumping oil immediately.

The trouble with loss of compression in the No. 4 cylinder is doubtless due to vour attempt to weld the sleeve, as this is a repair that should not be attempted. You should, accordingly, put in a new sleeve, and if necessary a new junk ring as well.

2—Can a 1921 Ford be changed to burn lights off the magneto? The battery and generator were removed as the customer did not want to use them. We moved the battery wire over onto the magneto plug and the lights burn for a while and then the motor stops. The engine would not start again until the wire was removed from the magneto post.—Wm. C. Allen, Galion, O.

2—The reason for the engine stopping is that the lights are unsuitable and draw too much current. It will be necessary to rewire the lighting circuits

as shown in the illustration. It will also be necessary to use 9 volt bulbs in each headlamp and it will be seen that the same current goes through both lamps so that if one burns out both of them go out.

WHY WHEELS TOE IN

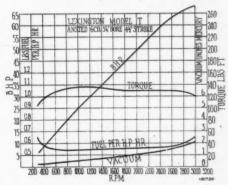
Q—Why is it that the front wheels of an automobile are toed in, in other words, are closer at the front than at the rear? We know that it makes a difference in tire mileage but cannot explain why. Some of our patrons think that the proper alignment would be with the wheels parallel and they cannot understand how it can be correct for the front wheels to be running at an angle.

1-When a car is running along the road all the bumps and road friction tend to push backward on the front wheels. As the wheels are pivoted at the kingpin, this tends to make both front wheels point outward, the right one going off to the right and the left one off to the left. In the connection between the front wheels we have a tie rod, the two arms of the steering knuckles and the connection between these arms and the tie rod. Accordingly, if we would have the wheels parallel when the car is standing on the floor we would find that running along the road there would be enough looseness in the tie rod connections and enough compression and bending in the steering knuckle arms to allow the wheels to actually point away from each other. Accordingly, we toe the wheels in a certain amount, usually from 1/4 to 34 in., so that when running on the road and under strain due to friction and bumps, the wheels will run practically parallel in spite of the strain tending to make them toe outward.

2—Give name of best portable cylinder grinder and reboring machine and advise if these are successful.—Western Tire Co., Tulsa. Okla.

2—A number of machines said to give good results will be given by letter. In reboring or reaming, a better surface will be obtained if this operation is followed by lapping, so as to smooth up the surface.

TORQUE AND H. P. CHART



Q—Give brake h.p. and torque of the Star, Durant and Durant Six automobiles.

—Automotive Associates, Inc., Pittsfield, Mass.

Torque and h.p. used in the Durant Six is shown. Data on the Star and Durant four is not available.

Universal Joints on 1921 and 1922 Passenger Cars Motor Age Maintenance Data Shoot No. 104

194	
No.	
Sheet No.	
Data	
r Age Maintenance	
Age	
Motor	

Number	Per Car	
	Type	Fabric Metal
REAR	Model.	8311 23 803 833 831
	Make	Own Peters Peters Spicer Spicer Spicer Spicer Own Aryac Own Aryac Spicer
	Type	Metal Me
FRONT	Model	331
	Make	Spicer Spicer Spicer Spicer Spicer Cown Cown Cown Cown Cown Cown Cown Cown
4	YEAR	1921-22 1921-2
200	MAKE & MODEL	Marmon, 34 1921–22 Spicer Maxwell 1921–22 Own Maxwell 1921–22 Own Mercer 1921–22 Spicer Meteor 1921–22 Spicer Monnel 1921–22 Spicer Monnel 1921–22 Spicer Monnel 1921–22 Own Norwal, & J. 20 1921–22 Own Norwal, & J. 30 1921–22 Own Oskland 1921–22 Spicer Own Oskland 1921–22 Spicer Spicer Norwal, & J. 1921–22 Spicer Spicer Oyeland 1921–22 Spicer Spicer Option 1921–22 Spicer Spicer Patency 1921–22 Spicer Spicer
Number	Per Car	ସସ୍ତ୍ରସ୍ତ୍ରସ୍ତ୍ରସ୍ତ୍ରସ୍ତ୍ରସ୍ତ୍ରସ୍ତ୍ରସ୍ତ
	Type	Fabric Fabric Fabric Metal
REAR	Model	5-8 Spec. 22 22 33,4 431,1 759 759 8.F 8.F 8.F 8.F 8.F 8.F 8.F 8.F 8.F 8.F
	Make	Norwalk Thermoid-H Detroit Bartford Spier Spier Own Thermoid-H Spier Own Thermoid-H Spier Own Thermoid-H Spier Spi
	Type	Fabric Metal
FRONT	Model	Spec. Spec. 228 428 428 428 428 428 428 428 428 428
	Make	Norwalk Detroit Detroit Detroit Detroit Hartford Seling Seling Seling Hartford Spicer Own
	YEAR	1922 1921 1922 1922 1922 1923
	MAKE & MODEL	Ambassador, R. Aee, G. Allen American American American Anderson, 40 Anterson, 40 Boure, 21-S. Beauto, 21-S. Beauto, 21-S. Beauto, 43-4 Beauto, 43-4 Beauto, 43-4 Beauto, 43-4 Beauto, 43-4 Casae, W.

Gearset Ratios and Data on 1921 and 1922 Passenger Cars

Motor Age Maintenance Data Sheet No. 195

MAKE & MODEL YE		MAKE	MODEL	LOCATION	LOCATION	Number		RATIOS			Rear Axle Ra
W MODEL	YEAR	***************************************	JDEL	LOURIUN	Forward Speeds	Low	2nd	3rd	4th	Reverse	Axie Ka
bassador, R	1922	Brown-Lipe		Unit w Eng	3	3.36	1.76	1.00		4.33	4.55
e, G	1921-22 1921	Warner		Unit w Eng Unit w Eng	3	2.85	1.71	1.00		4.00	4.83
en, 43	1921-22	Warner		Unit w Eng	3	3.52	1.71	1.00		3.96	4.63
derson, 40	1921-22	Durston	02500	Unit w Eng	3	3.09	1.86	1.00		3.87	4.50
person, 8	1921-22	Own		Sep. Unit	3	3.44	2.42	1.00		********	4.25
burn, Beauty	1921-22 1922	Grant-Lees	515	Unit w Eng		3.29	1.73	1.00		3.80	5.00 & 4.75
idle, B1ur Davis, 21-S	1922	Warner Muncie		Unit w Eng Unit w Eng	3 3	2.72	1.53 1.66	1.00		1.25 3.60	4.50
scoe, 4-34	1921	Own		Unit w Eng	3	2.86	1.70	1.00		3.57	4.18
ick, 6	1921-22	Own		Unit w Eng	3	3.36	1.76	1.00		4.32	4.60 & 4.90
ick 4	1922 1921–22	Own	*******	Unit w Eng	3	2.80	1.69	1.00		3.73	4.66
diffacse, V	1921-22	Own	515	Unit w Eng Unit w Eng	3	3.12 2.90	1.70 1.70	1.00		3.74	Opt. 4.72 & 4.87
se, W. & X.	1922	Own	010	Unit w Eng	3	2.98	1.73	1.00		3.12	4.66 & 4.87
almers,6	1921-22	Own		Unit w Eng	3	3.38	1.93	1.00		4.51	4.75 & 5.12
andler	1921-22	Own		Unit w Eng	3	2.98	1.73	1.00		3.90	4.44
evrolet, 490	1921-22 1921-22	Own	**********	Unit w Eng	3	3.22	1.77	1.00		4.20	3.66
le, 870.	1921-22 1921-22	Mechanics Northway	MU	Unit w Eng Unit w Eng	3 3	$\frac{3.07}{3.32}$	1.76	1.00		3.99 4.35	4.45
lumbia, Six	1921-22	Durston	02500	Unit w Eng	3	3.09	1.85	1.00		3.87	4.66 & 5.09
lumbia, Light 6	1922	Duraton	05000	Unit w Eng	3	3.09	1.85	1.00		3.87	4.55 & 5.1
met, C-53	1922	Muncie	T 25	Unit w Eng.	3	2.60	1.70	1.00		3.40	4.40
arier	1922 1922	Muncie	T 25A	Unit w Eng	3	2.60	1.70	1.00		3.30	4.60 & 5.0
nningham, V	1922	Brown-Lipe	35	Unit w Eng Unit w Eng	. 3	3.36	1.76	1.00	.85	4.32	3.13 4.23
niels, D19	1921-22	Own		Unit w Eng	3	3.10	1.60	1.00	.80	3.80	Opt.
vis, 51 & 61	1921 - 22	Warner	T 26	Unit w Eng	3	3.54	1.73	1.00		3.46	5.09
vis, 71	1922	Warner	T 64	Unit w Eng	3	3.11	1.69	1.00		3.78	5.10
des Prothess	1921-22 1922	Grant-Lees		Unit w Eng	3	3.00	1.89	1.00		3.60	4.75 & 4.8
dge Brothers	1922 1921–22	Own Warner		Unit w Eng Unit w Eng	3 3	4.66	1.91	1.00		2 70	4.16
ris, 6-au.	1921-22	Own		Unit w Eng	3	3.04 3.40	1.81	1.00		3.70 4.45	3.77 & 4.0 4.45 & 4.0
ggs	1922	Mechanics	MU	Unit w Eng	3	3.40	2.10	1.00	*********	4.01	4.75
Pont. A	1921-22	Brown-Lipe	35	Unit w Eng	4	3.29	1.61	1.00	.78	3.94	4.50
rant. A-22.	1922	Warner		Sep. Unit	3	3.32	1.77	1.00		4.21	4.30
rant, B-22	1922 1922	Warner		Sep. Unit		3.52	1.75	1.00		5.09	9.00
rl, 40ar, 4	1922 1922	Own Muncie		Unit w Eng Unit w Eng	3 3	2.85 2.60	1.69 1.70	1.00		3.40	3.66
ar, 6	1921-22	Warner	T 60	Unit w Eng	3	3.24	1.63	1.00		4.05	4.50 & 4.7 4.50 & 4.7
in, K	1921-22	Mechanics		Unit w Eng	3	3.07	1.77	1.00		4.00	4.25 & 4.7
ex	1921-22	Own		Unit w Eng	3	3.08	1.75	1.00			4.66 & 5.0
ris	1921	Brown-Lipe		Unit w Eng	3	2.98	1.73	1.00		3.90	4.08 & 4.6
rd, Tunklin, 9B	1921-22 1921-22	Own		Unit w Eng Sep. Unit	2 3	2.74	1.00	1.00		4.00	3.63
rdner	1921-22	Mechanics	MU	Unit w Eng	3	3.15 3.40	1.76 1.96	1.00		3.36	4.33
ant	1921-22	Durston		Unit w Eng	3	3.09	1.85	1.00		4.45	4.60
ay, R	1922	Detroit		Unit w Eng	3	3.38	1.60	1.00		4.16	3.90
lladay, 6	1921-22	Grant-Lees	515	Unit w Eng	3	2.90	1.70	1.00		3.80	4.91
iladay, 4	1922 1922	Grant-Lees		Unit w Eng		3.00	1.90	1.00		3.60	4 91
ndley Knight, Bnson, 6	1922	Warner Detroit		Unit w Eng Unit w Eng	3 3	3.04	1.81	1.00		3.70	4.40
rroun	1921-22	Grant-Lees	K	Unit w Eng	3	3.20	1.72	1.00		3.88	4.00
tfield.,	1921-22	Grant-Lees	K 20	Unit w Eng	3 .	2.98	1.89	1.00		3.62	4.63
ynes, 6	1921-22	Own		Unit w Eng	3	3.33	1.82	1.00		4.35	4.11 & 4.7
ynes, 12	1921-22	Own		Unit w Eng	3	3.33	1.82	1.00		4.35	4.60
C. S., 4.	1921-22	Brown-Lipe	30	Unit w Eng	3	3.04	1.81	1.00		3.70	4.50
dson	1921-22 1921-22	Own	30	Unit w Eng Unit w Eng	3 3	3.33	1.68	1.00		4.35 3.67	4.90 & 4.4
pmobile, R	1921-22	Own		Unit w Eng	3	2.99	1.89	1.00		3.63	4.87
kson, 6-38	1921-22	Covert	MU	Unit w Eng	3	3.62	1.91	1.00		4.46	4.75
vett	1922	Warner	T64B	Unit w Eng	3	3.11	1.69	1.00		3.78	4.45
dan	1921-22	Detroit	DY	Unit w Eng		3.20	1.78	1.00		3.88	4.66 & 4.4
ng	1921-22 1921-22	Own Warner		Unit w Eng Unit w Eng		3.19	1.87	1.00		3.88 4.05	4.08 & 4.8 3.64 & 4.2
sel, 45. ne Kar, 6-55-K	1921-22	Grant-Lees	515	Unit w Eng	3	2.98	1.63	1.00		3.90	4.58 & 4.7
rayette, 134	1921-22	Omeron		Unit w Eng	3	3.04	1.70	1.00		3.66	4.15 & 4.9
acn, 999	1921-22	Brown-Lipe		Unit w Eng	3	3.33	1.68	1.00		4.35	4.50 & 4.3
kington	1921-22	Warner Detroit	D47	Unit w Eng		3.24	1.63	1.00		4.05	4.62 & 5.1
erty	1921-22 1921-22	(PWD		Sep. Unit		3.20	1.72	1.00		3.88	4.66 & 4.8
comobile	1921-22	Own	********	Unit w Eng Sep. Unit	3 4	3.09 4.00	1.76 1.92	1.00	1.00	3.66 5.12	4.45 3.20 & 3.8
rraine, T.	1921	Own. Muncie. Muncie.		Unit w Eng	3	3.00	1.89	1.00	1.00	3.62	4.63 & 4.7
iibohm. B	1921-22	Muncie	T 25	Unit w Eng Unit w Tor. T	3	2.60	1.70	1.00		3.40	5.00 & 4.5
rmon	1921-22	Own		Unit w Tor. T	3	3.36	1.63	1.00		4.32	3.00 & 4.1
xwell. Farlan.	1921-22 $1921-22$	Own Own Brown-Lipe		Unit w Eng	3	4.75	2.04	1.00		7.12	4.60
ercor	1921-22 1921-22	Brown-Line	35	Sep. Unit		3.36 3.69	1.51 2.12	1.00	1.00	4.43 3.20	3.50 & 3.7 3.87
MIT	1921-22	Brown-Lipe Muncie	T 25	Unit w Eng		2.60	1.70	1.40	1.00	3.40	4.60
812	1921	Brown-Lipe Dundore		Unit w Eng	3	3.34	1.66	1.00		4.17	4.67
eteor. tchell, F-50	1921-22	Dundore	K	Sep. Unit Unit w Tor. T	4	2.69	1.56	1.00	.73	3.46	3.92 & 4.4
HILDE	1921-22			Unit w Tor. T	3	3.29	1.75	1.00		4.66	4.42
PUII. D-4K	1922 1921-22	Mechanics		Unit w Eng Unit w Eng	3	3.71	2.20	1.00		4 10	5.30
10n. b-40	1921-22	Warner		Unit w Eng		3.30	1.60 1.70	1.00		4.10	4.66
1811, 4	1921-22	1 Uwn		Unit w Eng		3.25	1.82	1.00		4.33	4.45
ish 6. Itional, BB.	1921-22	Own		Unit w Eng	3	3.24	1.80	1.00		4.30	4.50 & 4.5
itional, BB	1921-22	Brown-Lipe	30	Unit w Eng	3	3.33	1.68	1.00			4.08
orna, 3C orwalk, 4-30.	1921 22	Detroit		Unit w Eng.		3.20	1.72	1.00		3.88	4.45
ikland	1921-22 1921-22	Grant-Lees	K	Unit w Eng		3.00	1.84	1.00		3.60	5.00
dsmobile, 43A	1921-22 1921-22	Muncie Warner	283	Unit w Eng Unit w Eng	3 3	3.53	1.74	1.00			4.66
	1921-22	Warner		Unit w Eng	3	3.52 3.52	1.73	1.00			4.66
	1922	Warner	279	Unit w Eng	. 3	3.52	1.74	1.00			5.10
aren	1922	Brown-Lipe	30	Unit w Eng	3	3.33	1.68	1.00			4.00
ren											
rerland.	1922 1921-22	Own		Unit w Eng Unit w Eng	. 3	3.93 3.37	2.19 1.78	1.00		5.23	4.50

MAKE & MODEL	YEAR	MAKE	MODEL	MODEL	LOCATION	Number		RATIOS				
MAKE & MODEL	IEAR	MAKE	MODEL	LOCATION	Forward Speeds	Low	2nd	3rd	4th	Reverse	Rear Axle Ratio	
aige, 6-42 & 44.	1921-22	Own		Unit w Eng	3	2.92	1.64	1.00		3.90	4.50 & 4.75	
aige, 6-66	1921-22	Own		Unit w Eng	3	2.92	1.63	1.00		3.90	4.55 & 3.54	
an, A	1921	Own		Unit w Eng	3	3.00	3.00	1.00		4.00	4.90	
aterson	1921-22	Durston		Unit w Eng	3	3.00	1.85	1.00		3.87	4.50	
eeriess	1921-22	Own		Unit w Eng	3	3.33	1.68	1.00		4.35	4.90	
Piedmont, 6-40	1921	Grant-Lees		Unit w Eng.	3	2.98	1.73	1.00		3.90	3.45	
	1921-22			Sep. Unit	9	3.45	1.73	1.00		4.26	3.75 & 4.29	
Pierce Arrow		Own	A CHTTOP		3							
Pilot	1921-22	Muncie		Unit w Eng	3	2.61	1.70	1.00		3.40	2.66 & 2.50	
orter	1921	Own		Sep. Unit	4	3.40	1.97	1.36	1.00	4.37	3.00 & 3.3	
remocar	1922	Mechanics		Unit w Eng	3	3.04	1.75	1.00		3.99	4.66 & 5.0	
Premier, 6-D	1921 - 22	Own		Unit w Eng	3	3.21	1.87	1.00		3.88	4.50	
R. & V. Knight, J	1921-22	Brown-Lipe	30	Unit w Eng	3	3.33	1.68	1.00		4.35	4.75 & 4.9	
R. & V. Knight, R	1921-22	Brown-Lipe		Unit w Eng	3	3.33	1.68	1.00		4.35	4.75 & 4.5	
800	1921-22	Own		Sep. Unit	3	3.68	1.80	1.00		5.00	4.70	
Revere	1921-22	Brown-Lipe		Unit w Eng	4	3.66	2.00	1.30	1.00	4.00	3.00 & 4.0	
Rickenbacker	1922	Own		Unit w Eng	3	3.12	1.69	1.00	1.00	3.78	4.63	
Roamer	1921-22	Grant-Lees		Unit w Eng	3	2.71	1.57	1.00		3.54	4.08 & 4.4	
				Unit w Eng	0						4.00 0 4.4	
oamer, 4-75	1921-22	Brown-Lipe	35	Unit w Eng		3.29	2.60	1.00	.78	3.94	3.77 & 4.0	
Rolls Royce	1922	Own		Sep. Unit	4	3.40	2.23	1.16	1.00	3.40	3.25	
Saxon, 125	1921-22	Covert	L .	Unit w Eng	3	3.61	1.82	1.00		4.50	4.75	
ayers, Six	1921-22	Grant-Lees		Unit w Eng	3	2.98	1.73	1.00		3.90	4.75	
cripps Booth	1921	Warner		Unit w Eng	3	3.52	1.73	1.00		3.96	4.50	
eneca	1921-22	Warner	В	Unit w Eng	3	2.98	1.73	1.00		3.62	4.75	
Seneca 50	1922	Grant-Lees		Unit w Eng	3	3.00	1.89	1.00		3.62	4.75	
kelton, 35.	1921	Muncie		Unit w Eng	3	3.67	1.60	1.00		4.37	4.25 & 4.5	
tandard	1921-22	Grant-Lees		Unit w Eng.	3 1	2.71	1.57	1.00		3.54	4.45	
tanwood	1921-22	Grant-Lees		Unit w Eng	3	2.71	1.57	1.00		3.54	4.50	
	1921-22	Grant-Lees	Clarent	Spec. Unit	3							
tar		Warner		Spec. Unit		3.32	1.77	1.00		4.21	4.87	
tearns Knight, SKL4	1921-22	Own		Unit w Eng	3	3.01	1.66	1.00	· · · · · · · · · · ·	3.70	4.50	
tephens, 90	1921-22	Mechanics		Unit w Eng	3	3.24	1.66	1.00		4.16	4.90 & 5.4	
tevens-Duryea, E	1921-22	Own		Unit w Eng	3	3.40	1.97	1.00		4.37	3.94	
tudebaker, Light 6	1921-22	Own		Sep. Unit	3	3.45	1.87	1.00		4.15	4.55 & 5.0	
tudebaker, Special 6	1921-22	Own		Sep. Unit	3	3.64	2.00	1.00		4.76	4.33	
tudebaker, Big 6	1921-22	Own		Sep. Unit	3	3.64	2.00	1.00		5.46	3.71 & 4.3	
tutz	1921-22	Own		Unit w Re. A	3	2.61	1.61	1.00		3.54	3.30 & 3.7	
emplar	1921-22	Detroit	DV	Unit w Eng	3	3.20	1.72	1.00		3.88	4.40	
	1921-22	Muncie	G 25	Unit w Eng.		2.60		1.00				
ulsa				Unit w Eng	3		1.70			3.40	4.50	
elie, 34	1921-22	Durston		Unit w Eng		3.09	1.86	1.00		3.87	4.72	
/elie, 48	1921-22	Durston		Unit w Eng	3	3.09	1.86	1.00		3.87	4.66	
/elie, 58	1922	Durston		Unit w Eng		3.09	1.86	1.00		3.87	4.66	
Vasp, 1921	1921	Dundore		Unit w Eng	4	2.69	1.56	1.00	.73	3.46	3.70	
Vashington	1922	Warner		Unit w Eng	-3	3.24	1.63	1.00		4.05	4.67	
Wescott, 48	1921-22	Brown-Lipe	M 30	Unit w Eng	3	3.33	1.68	1.00		4.35	4.44	
Vescott, 38	1921	Warner		Unit w Eng	3	3.09	3.24	1.63		4.05	5.09	
Villys-Knight	1921-22	Overland		Unit w Eng		3.21	1.89	1.00		4.13	4.44	
/inton	1922	Warner				3.04	1.81	1.00	1			

ABBREVIATIONS:—Unit w Eng.—Unit with Engine. Sep. Unit—Separate Unit. Unit w Re. A—Unit with Rear Axle. Unit w Tor. T—Unit with Torque Tube. Opt—Optional. The columns headed "Low Speed", "Second Speed", "Third Speed" and "Reverse" are Transmission Ratios. These should not be confused with the total gear reduction which is the product obtained by multiplying the rear axle ration by the transmission ratio.

Some Suggestions for Tire Advertising

Selling Quality Tires Through the Newspaper; Combating the "Gyp Artist" Who Is Ruining Tire Sales

T is a well-known fact that tire repairing during the past two years has become more or less unusual. It is an equally well-known fact that the "gyp artist" who has entered the tire field is responsible for this condition. The makers and sellers of the famous \$3 cord tires are on the edge of the cliff now and it is about time they were given a good shove. You can do this through your advertising. The retailers of the high grade tires who suffered from the oppression of the gyp can again come into their own and they needn't be a bit afraid of how they go after the gyp, just so they get him and put him out of business.

The public has had about enough of the tire bandits and are gradually returning to the purchase of better tires. With the coming of Spring, it would be a good idea for the retailers of tires to combine and put the finishing touch to the parasite. Re-tiring is a big part of Spring overhauling and those cars that have been up on the blocks during the cold weather will come down with new tires on them—if you get after them now and sell.

Undoubtedly the gyp will return from his winter home to engage in his old pastime of flaying the public and you. It is up to you to defend your customers and the best way to do this is to advertise. If you sell them their tires, then there is no chance for the parasite to hang on. Warn the buyers against the dangers of the cheap tire. Most of them know now but folks are wont to fall again and again for the pretty yellow on the back of the stock certificate.

In the well-known long run, everyone knows that no matter what the commodity, it is better to pay more and know what you're getting than to take a chance on the fire sale stuff. For a while some of the gyps were getting away with a tire repair business—that proves how far people can be lead.

Some time ago, a tire merchant in the west wrote to Motor Age and complained of this condition—said that the parasite was virtually forcing him out of business. His repair department had done no work in a long time and sales were on the slip. The classified sections and even the display space in newspapers were loaded with "tire bargains" telling

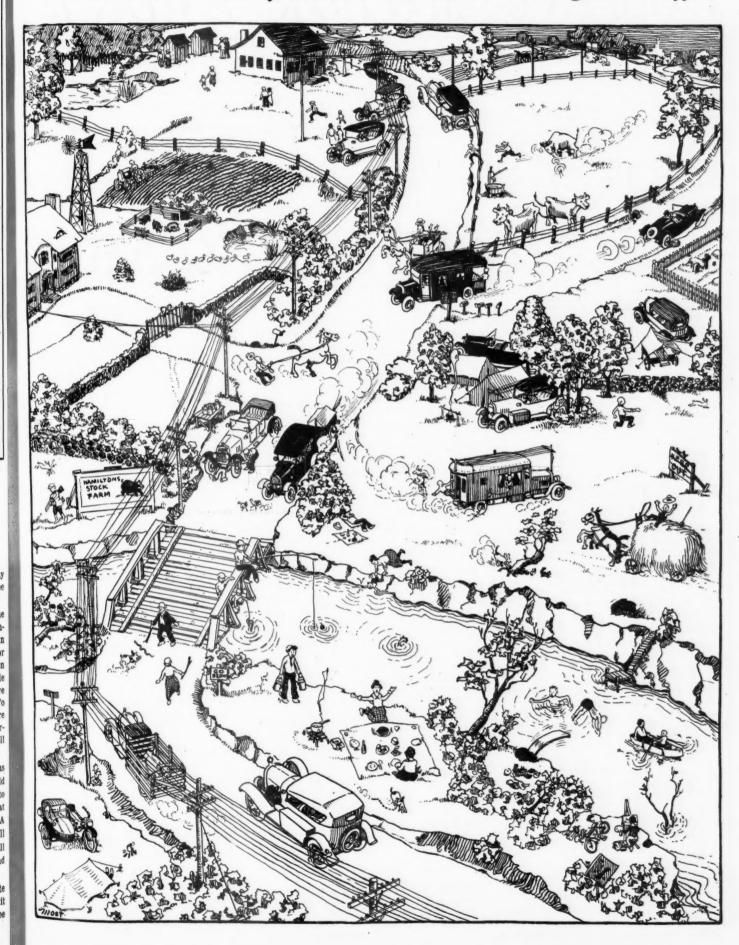
of "cord tires guaranteed" all the way from 8,000 to 20,000 miles for from three dollars to eight dollars.

The gyp showed a tire and if he charged three dollars for it, he guaranteed it for 8,000 miles. The next man entering was shown the same tire for \$4 and he got a 10,000-mile "written guarantee." The result is that the people who were victims of these outrages have come to doubt even the good tires. To regain the confidence lost and to insure your customers against further robberies, a series of unconventional ads will help.

On these pages are a few suggestions as to the kind of copy which should prove effective. You can write ads to fit your own situation, remembering that you are out to win back your trade. A reassurance that you are there to sell tires which will give real service is all that is necessary to put the rope around the parasite's neck.

Your customers will see and appreciate your effort to do square dealing and it is not at all unlikely that you will be rewarded.

A Panorama View of the Summer Tourist Doing His Stuff



COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Bridgeton, N. J. Eighth Annual Automobile Show. Mar. 31-Apr. 7
Auburn, N. Y. Annual Automobile Show April
Eau Claire, WiscAnnual Automobile Show
Alpena, Mich
Red Bank, N. J. Eighth Annual Show. May 7-12
New York
modore
Green Bay, WisAnnual Automobile ShowAug. 27-30
SacramentoAnnual Automobile ShowSept. 3-8
MemphisAnnual Automobile ShowSept. 28-30
Freane. CalifAutomobile Show
Little Rock, ArkAnnual Automobile ShowOct. 8-13
Waco, Texas Waco Automobile Dealers' Assn. Oct. 20-Nov. 5
New YorkSalon at the Hotel AstorNov. 4-10

CONVENTIONS

Spring	Lake,	N.	JSummer Engine			Automotive June	19-23
Dixville	Notel	ı, N.				e Equipment June 25-J	
Olympia	, Was	h	Conventi			Trade	July

RACES

F	A	F00	3011	. W A	421	C	36	-
Indianapolis	Annual	200	DATES	Inter	national	Sweepstakes	May	20
Tours, Fran	ceGrand	Dair	500	Mile I	Dago		July	
IUUIS, FIRM	CC OI MIIU	LILL	300	TANKER .	Lette		WILLY	-

SQUEEKS & RATTLE

-Tut.

SMILE!

Smile!

The sky is blue enough without you adding to it Smile!

What if the times are tough, you didn't do it Smile!

Your face won't crack at all, go on and try it Smile!

Your grin may be a stall but just deny it. Smile

It won't cost you a cent, so just go to it. Smile!

And then some other gent will also do it!

Saving Money for the Car Owner

Motorist: I wish you'd see if you can get that squeak out of my motor.

Mechanic: I wouldn't worry about that if I were you-in another week the car will be rattling so you won't notice it. -Sam Haskins.

"What's the difference," asks someone, "between an optimist and a pessimist?

A pessimist is a guy who can only see a hole while an optimist can see a doughnut around the hole.

Epitaphs of Great Men of Today Here lies

AUGUSTUS LUMPA

He was in a hurry to attend a coroner's inquest and tried to bunt a locomotive off the crossing with his flivver. HE WAS AT THE INQUEST

Busy Mechanic's Definition of Electricity Condensed heat, with no place in particular to go but in a hell of a hurry to get there.

—E. L. Martin.

Favorite Agonies

My favorite agony is the guy who comes into the shop moaning about how he got "gypped" on his car, how it never works right and all that sort of thing, when all that's wrong is a twist on the carbureter to make it "hit right."—Lew Brication.

(What's your "Favorite Agony"? Tell us about it.)

Ten Dollars! Next!

"The way your son runs his racing car is an art."
"Yes. And too frequently it's a fine art."

Us Guys Have Made Squeeks & Rattles

Lew Brication	Frank Tierney	J. W. S.
Нар	Tom Walsh	W. E. Allen
J. V. M.	Jones	R. B.
Kenneth Kee	Pat	John Rooks
Roy L. Miller	M. C. V.	A. Oransky
B. C. B.	Hym.	A. J. McCann
C. E. Packer	LFB	J. M. Ravenna
The Grease Hound	A. Nutt	Lee Gage
Roy Frederickson	Ima Dumbell	Robert R. West
G-ee H-aw Jay	A. H. Jennings	Ervin Miller

All right, all together, let's hear from you again, and all those of you who want to be numbered among "Us Guys" get out the old pencil and send us something.

Suggested Summer Motor Trips

(From Detroit Motor News) From Alpha to Omega. From Hell to breakfast. From soup to nuts. From sublime to ridiculous. From pillar to post. From bad to worse.

The most amusing experience I can remember was watching a man hunt two hours to find WHICH wire connected to an oil hole in the ignition unit.-Roy L. Miller.

"A fool can ask more questions than a wise man can answer. Isn't that so?" "I cannot answer you."—Boston Transcript.

Two Fables and a Fact

(By B. C. B.)

Once upon a time there was a busy service manager. He received nothing but pleasant words from everyone. He passed away.

The Worst Customer I Ever Dealt With

Was a bird wearing a coffee-colored derby that was obviously built for somebody else. wanted to trade in a baby carriage and a tricycle on a new car.-J. S. Haight.

A writer says chop sucy is not what it used to be. He will now confer a favor by telling us what it used to be .- New York Morning Telegraph.

Fable

Once there was a motorist, who, when handed a "ticket" by a traffic cop, tore it up and threw it in the copper's face. The copper knew that he had hurt the motorist's feelings and apologized.

Specifications of Current Motor Truck Models

NAME AND MODEL	Tens	Chassis Price	Bore and Stroke	1	Rear	Final Drive	NAME AND MODEL	Tons	Chassia	Bere and Stroke	Frent	Rear	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	ES Rear	Fina Drive
Ace. 30 Ace. 40 Ace. 60 Acme 30 Acme 40 Acme 60 Acme 60 Acme 60 Acme 60 Acme 90	2 21/2-3 1 11/2 2 3 41/2	\$2400 2850 3400	35/8x5 41/8x51/4 41/8x51/4 33/4x5 33/4x5 33/4x5 41/8x51/4 41/2x51/2	34x3½ 36x4 36x4 35x5n 34x3½ 34x3½ 36x4 36x4 36x5	34x6 36x7 36x8 35x5n 34x5 34x5 36x7 36x7k 40x10	W W W W W	Corbitt E-22 Corbitt D-22 Corbitt C-22 Corbitt B-22 Corbitt B-22 Corbitt R-22 Corbitt A-22 Corbitt A-22 Corbitt A-22	31/2-4	\$1480 2200 2600 3000 3200 3800 4500	3 ³ 4x5 3 ³ 4x5 4 ³ 4x5 ³ 4 4 ³ 4x5 ³ 4 4 ³ 2x5 ³ 2 4 ³ 2x5 ³ 2 4 ³ 4x6	34x3 ¹ / ₂ 34x3 ¹ / ₂ 36x3 ¹ / ₂ 36x4 36x4 36x5 36x6	34x4 34x5 36x7 36x7 36x8 36x10 40x6d	W W W W W	Gary	5 1 1 ¹ / ₂ -2 2 ¹ / ₂ 3 ¹ / ₂ -4	\$2850 3790 4450 2075 3000 3375 4475 5500 1265	4½x5½ 4½x6 5 x6½ 3¾x5½ 4 x5¼ 4 x5¼ 4½x5½ 5 x6½ 3½x4½	36x4 36x5 36x6 34x5 36x6 36x4 36x5 36x6 33x4 ¹ / ₂ n	36x8 40x5d 40x6d 34x5 38x7n 36x7 36x10 40x14 34x5n	W W W W W W W
Acme 125 American 255 American 40 American 50 Armleder 20 Armleder 40-B Armleder 40-C Armleder HW-B Armleder HW-C Armleder KW-B	614 21/2 4 5 1 11/2 21/2 21/2 31/2	3350 4275 4500	434x6 4 x6 41/2x6 41/2x6 334x51/4 334x51/4 41/4x51/2 41/4x51/2 41/4x51/4 41/2x6	36x6 36x4k 36x5k 36x5 34x3½k 34x3½k 34x3½k 36x4k 36x4k 36x5k	34x6k 34x6k 34x6k 36x7k 36x7k 36x5dk	W W W W W W W W	Day-Elder. AS Day-Elder B Day-Elder D Day-Elder C Day-Elder F Day-Elder E Dearborn E Dearborn FX Dearborn FX Dearborn 48	1 11/2 2 21/2 31/2 5 11/2 11/2 2	1600 2000 2400 2750 3150 4250 1600 2300 2180 2590	3 ³ 4x5 3 ³ 4x5 4 ¹ 6x5 ¹ 4 4 ¹ 4x5 ¹ 2 4 ¹ 2x5 ¹ 2 4 ¹ 2x5 3 ³ 6x5 ¹ 8 3 ³ 4x5 ¹ 8 3 ³ 4x5 ¹ 8	35x5n 34x3½ 36x4 36x4 36x5 36x5k 35x5n 34x4 34x4 34x4	35x5n 34x5 36x7 36x7 36x5d 40x6dk 35x5n 34x5 34x5	W W W W W W W	Grabam Bros IGramm-Pion 15 IGramm-Pion 65 IGramm-Pion 30 IGramm-Pion 30 IGramm-Pion 30 IGramm-Pion 50 IGramm-Pion 50	$1\frac{1}{2}$ -2 $1\frac{1}{2}$ -2 2 -2 $\frac{1}{2}$ 3	1325 1245 1750a 2250a 2475a 3300a 4225a 3850a 4450a	37/8x41/2 31/2x5 38/4x5 38/4x5 38/4x5 41/8x51/2 41/2x51/2 41/2x51/2 42/4x6	33x4½n 33x5n 36x3½k 36x3½k 36x4k 36x5k 36x6n 36x5 36x6	33x5n 36x5k	B W W W
Armleder . KW-C *Atlas . 22 *Atlas . 44 Atterbury . 20R Atterbury . 22C Atterbury . 22C Atterbury . 22D Atterbury . 22D Atterbury . 8E Autocar . 21UF	1 11/2-2 11/2 21/2 21/2 31/2 31/2 5 5 11/2-2	1495 1950 2475 3375 3475 4275 4375 4975 5125 2200	41/4x51/2 33/4x51/8 33/4x51/8 33/4x5 41/8x51/4 41/2x51/2 41/2x51/2 41/2x51/2 43/4x6 43/4x6 43/4x41/2t	36x6n 34x3½ 36x4 36x4 36x5 36x5 36x5 36x5	36x5dk 34x4½1 36x6n 34x5 36x4d 36x4d 40x5d 40x5d 40x6d 40x6d 40x6 34x6	W W W W W W W W	Defiance G Defiance D Defiance E Denby 31 Denby 33 Denby 35 Denby 27 Denby 210 Dependable A Dependable C Dependable D	11/4 11/2 21/2-3 4 5 34-1 2 21/6	1525 1845 2075 1485 2145 2795 3895 4295 1650 2350 2650	334x5 334x5 334x5 334x5 334x5 414x514 412x512 414x514 414x514 414x514 414x514 414x514 414x514 414x514 414x514	35x5n 35x5n 35x5n 35x5n 35x5n 36x4 36x5 36x6 34x5n 34x31/2 34x5	35x5n 36x6n 38x7n 35x5n 36x7n 36x7 36x5d 40x6d 36x6n 34x5 36x6	B I I B I I I W W	Hall 1½ Hall 2½ Hall 3½ Hall 5 Hall 7 chain Harvey WA Harvey WHA Hawkeye 0 Hawkeye K	11/2 21/2 31/2 5 7 2 21/2 31/2 1	3100 3275 4100 5100 5100 2650 2950 3950 1375 1645	334x5 418x514 412x512 412x512 414x512 414x512 414x512 414x513 415x6 358x518 334x512	34x5n 36x4 36x5 36x5 36x5 34x4 36x4 36x5 34x5n 34x31/21	38x7n 36x6 36x5d 40x6d 40x6d 34x7 36x7 36x5d 34x5n 34x5h	W W W C W W W
Autocar. 21UG Autocar. 27H Autocar. 27K Autocar. 26-B Available. H1½ Available. H2½ Available. H3½ Available. H3½ Available. H5 *Avery.	11/2-2 2-3 2-3 4-6 4-6 11/2 2 21/2 31/2	2300 3100 3200 4200 4350 2475 2775 3160 4175 5375	4 x5 1 2 4 x5 1 2 4 x5 1 2 4 1 4 x5 1 2 4 1 4 x5 1 2 4 x5 4 x5 4 x5 4 x5 4 x5 4 x5 4 x5 3 x4s		34x6 36x7 36x7k 36x12 36x12 36x5k	D D D W W W W W W I	Dependable . E. Diamend T	3 1-114 112 212 312 5 5 212 312 6	2950 1975 2250 2650 3750 4325 4500 4100b 5100b 6000b 730	41/4x51/2 33/4x51/4 4 x51/4 41/4x51/2 41/4x51/2 41/4x53/4 43/4x53/4 5 x61/4 37/4x41/2	36x4 36x3½ 36x3½ 36x4 36x5 36x6 36x6 36x5 36x5 36x5 36x6 32x4n	36x7 36x4n 36x5 36x8d] 36x5d 40x6d 40x6d 36x7 36x5d 40x6d 32x4n	W W W W C C C C B	Hawkeye. M Hawkeye. N Hendrickson. O Hendrickson. N Hendrickson. K Hufman. B Hufman. C Hufman. D Hurlburt. A-A Hurlburt. B-B	2 3½ 1½ 2½ 3½ 5 1½-2 1½-2 2-3 1-1½ 2-2½	2145 3700 2200 2690 3000 4000 1795 1695 2895 1950 2800	4\4x5 4\2x6\34 3\5x5\8 4\4x5\34 4\4x5 5 x6\4 3\34x5 3\34x5 4\4x5\2 3\34x5 4\4x5\2 3\34x5 4\4x5\2	36x4k 36x5k 36x4n 36x4k 36x5k 36x6 34x3½ 36x3 36x4 34x5n 36x4	36x6k 36x10k 36x5n 36x7k 36x5dk 40x6 34x6 36x6 36x7 34x5n 36x4d	WW
Beck A Jr. Beck B-30 Beck C-40 Beck D-50 Bell M (Iowa) Bell E (Iowa) Bell O (Iowa) Bell Bessemer G	11/2 2 21/2 1 11/2 21/2	1285a 1350 1550 1950 1495 2100 2550 1450	3½x5 3¾x5 3¾x5 4½x5¼ 3¾x5 4½x5½ 3½x5 4½x5 3½x5 3½x5 3½x5	34x4½1 34x5 36x6 38x7 35x5 34x3½ 34x4 35x5n	34x4½1 36x6 36x6 40x8 35x5n 34x5 34x6 35x5n	w I	Derris K-2 Derris K-4 Derris K-7 *Derris I03 Double Drive B Duplex A Duplex E Duty 22	3 2 31/2	2490 3400 4400 685a 4000 2775 3500 1590	4 x5½ 4½x5½ 4½x5½ 3½x5 4½x5½ 4½x5½ 4½x5½ 3½x5	33x5n 36x4 36x5 31x4n 36x6 35x5n 36x8 34x3½	33x5n 36x7 36x10 34x4n 36x6 38x7n 36x8 34x5	W W B W W I I	Hurlburt. C-C Hurlburt. D-D Hurlburt. E-E Indep'd't(Iowa) B Indep'd't(Iowa) G Indep'd't(Ia.) HI *Indiana 10 Indiana 12	1 1 1 1/2 21/2 1	3475 4150 4850 1665 2040 2940	41/4x51/4 41/2x6 43/4x61/4 31/2x5 33/4x51/4 41/2x51/4 33/4x51/4 33/4x51/4	36x5 36x5 36x6 34x3½ 34x3½ 36x4 34x5n 34x3⅓	36x5d 36x6d 40x6d 34x4 34x5 36x7 34x5n x 34x5k	W W W
Bessemer H-2 Bessemer J-2 Bessemer K-2 Bessemer K-2 Bethlehem KN Bethlehem HN Brinton C Brinton C Brockway E Brockway S-5 Brockway KR	11/2 21/2 4 1 2 3 1 11/2 11/2	1990 2895 3695 1385 2185 2985 2500 2975	33/4x5 41/8x51/4 41/2x51/2 31/2x5 4 x51/4 41/2x6 33/4x5 41/8x51/4 4 x5 4 x5 4 x5 4 x5 4 x5 4 x5 4 x5 4 x	36x3½ 36x4 36x5 35x5n 34x4 36x5 34x4 36x4 33x5n 36x4 36x4 36x4	36x5 36x4d 36x10 35x5n 34x6k 36x10 34x5 36x7 33x5n 36x6 36x6 36x8	DD I B D W W B W W W W	Eagle. 101 Eagle. 100-2 F. W. D. B Fageol 12 Fageol 22 Fageol 35 Fargo R	3 11/2 21/2 31/2 5	1875 2275 4200 3000 3900 5000 5700 1700	35/4x5/4 33/4x5/4 43/4x5/4 43/4x5/4 43/4x5/4 41/2x6/4 41/2x6/4 33/4x5	34x5 34x4k 36x6 34x3½ 34x4 36x5k 36x6 36x6 36x4 —x5n	34x5 34x7k 36x6 34x6k 36x7 40x5dk 40x6d 36x6 —5n	B W W W W	Indiana	2 2½-3 3½-4 5-7 1 11½ 2 2½ 3	1250 1550 1650 2100 3500 2400 2600 3600	41/8x5/2 41/8x5/2 43/8x5/2 5 x6/4 31/2x5/3 31/2x5/4 31/2x5/4 41/4x5 41/4x5	36x4k 36x4k 36x5k 36x5k 32x4½ 36x3½	36x7k 36x8k 36x5dk 40x6dk 1 32x4½ 2 36x3½ 3 36x5k	W W W W M M M M M M M M M M M M M M M M
Brockway . K-5 Brockway . RT Brockway . R-4 Brockway T-4 *Buick	21/2 31/2 31/2 5 1/2	945b	41/8x51/4 43/4x6 41/2x51/2 43/4x6 33/4x43/4	36x4 36x5 36x5 36x6 31x4n	36x8 36x10 36x5d 40x6d 31x4n 38x7 1 30x31/2	W W W B	Federal. SD Federal. TE Federal. UE Federal. WE Federal. WE Federal. X2 *Ford. TI Front Drive. C	11/2 11/2 2-21/2 31/2-4 5-6 1	380 2800	334x5 418x514 418x514 418x514 418x514 434x6 334x4 334x4	35x5n 36x3½ 36x4 36x5 36x6	36x6n	W W W W W W	International 102	11/2	3100 1750 2075 2550 3350 3850	4 x5½ 3½x5 3¾x5 4½x5 4½x5½ 4½x5½ 4½x5½	36x5	36x12 36x12 36x7 34x5 36x6 36x8 40x10 40x6d	W W W
*Chevrolet. "Chevrolet. G *Chevrolet. G *Chevrolet. T *Chicago. C1½ (Chicago. C3½ (Chicago. D5 (Clydesdale. 10 (Clydesdale. 18 (Clydesdale. 26	1 11/2 21/2 3:/2 5	1485 1535 1890 2385	3 14x4 3 14x5 14 4 x5 4 x5 4 12x5 12 4 12x5 12 3 3 4x5 3 3 4x5 3 3 4x5 3 3 4x5	34x4n 33x4n 36x3½ 36x4k 36x5 36x6 34x5n 34x5n 34x5 34x5	34x4½ 35x5n 36x5k 36x7k 36x10 40x12 34x5n 34x5n 34x5 34x5k	N B W W W B B W W	G.M.C K-101A G.M.C K-101T G.M.C K-101T	2 5† 3½ 3½ 10† 5 15†	1295 2375 2375 2450 3600 3700 3700 3950 4050	3½x5½ 4 x5½ 4 x5½ 4 x5½ 4 x5½ 4½x6 ½x6 ½x6 ½x6 ½x6 ½x6 ½x6	34x5n 36x4k 36x4k 36x4 36x5 36x5 36x5 36x5 36x5 36x5	34x5n 36x7k 36x8 40x5d 40x5d 40x12 40x0d 40x14 40x6d	B W W W W W W	Kalamazoo G-I Kalamazoo G-I Kalamazoo HD Kalamazoo HD Kalamazoo OK Kalamazoo OK Kelly-S. K-31 2Kelly-S. K-34 2Kelly-S. K-34	1 11/2 2 3 3 4 5 11/2 21/2	1295 2100 2645 3350 3350 4000 4500 2700 2700 2900	4 x5 3 ³ / ₄ x5 4 x5 4 x6 4 ¹ / ₄ x6 4 ¹ / ₄ x6 4 ¹ / ₂ x6 3 ³ / ₄ x5 ¹ / ₄ 3 ³ / ₄ x5 ¹ / ₄	34x5 34x4 36x4 36x5 36x5 36x5 36x6 36x3 236x3 36x3 36x4	34x5n 34x5 36x7 36x10 36x10 36x12 40x6d 36x6 36x6 36x4d	W W B W W W W W C W
Clydesdale. 20 Clydesdale. 42 Clydesdale. 65EX Clydesdale. 65EX Clydesdale. 93 Clydesdale. 120 Commerce. 7 Commerce. 10 Commerce. 12 Commerce. 12 Commerce. 12 Commerce. 16	$ \begin{array}{c} 34-11 \\ 34-11 \\ 34-11 \\ 112 \\ 112 \end{array} $	2475 3250 3450 4100 4500 1150 1450 2500 1695 1800 1995	334x5 41/2x51/2 41/2x51/2 41/2x51/2 43/4x6 33/4x5 33/4x5 33/4x5 33/4x5 33/4x5 33/4x5	36x6 32x41/2	36x6 36x8 36x8 36x10 40x12 1 32x4½ 3 34x4½ 33x5n 34x4 35x5n 34x6	W W W W M B B B B I I	*Garford 15 Garford 25-B Garford 70-H Garford 77-D Garford 68-D Garford 150-A	1 11/2 1 11/2 21/2 4 5 71/2 1-11/2	1850 1590 2190 2750 3750 4500 5200 1775 2450	334x514 358x518 334x518 414x512 412x6 5 x612 334x5 4 x512	35x5 34x5n 36x3½ 36x4 36x5 36x6 36x6 36x3½ 36x3½	36x8 36x5d 40x5d 40x7d 36x5	W W W W C W W	2Kelly-S. K-42 2Kelly-S. K-50 2Kelly-S. K-60 2Kelly-S. K-61 Kimball AB Kimball AC Kimball AK	31/2 31/2 5 6 5-7 21/2 4	2900 3900 3900 3900 4400 4600 4800 3675 3975 4500 5000	334x54 412x612 412x612 412x612 412x612 412x612 412x612 412x612 414x6 414x6 414x6 434x6	36x4 36x5 36x5 36x6 36x6 36x6 36x4 36x4 36x4	36x4d 40x5d 36x10 40x5d 40x6d 40x7d 36x7d 36x7 36x8 36x10 40x12	W C C I W C C I W W W W
Commerce 16 Commerce 18 Commerce 25 Commerce 25 Cook 51 *Corbitt	21/2 21/2 21/2 21/2	2150 2150 2495 2425 2770 3600 1250	33415 419x514 419x514 418x514 418x514 4 x518 312x5	35x5n 36x4 36x6n 36x4 36x6	36x6n 36x7 40x8n ·36x7 40x8n 40x8n 33x5n	W W W	FINAL DRIVI tion, I—Internal r—8 cyl. s—6 cy k—pneumatic ti a—price includes body. *—expro Make. trac.—tu	Gear, vl. t— res opt s severa ess tru	W—Wor 2 cyl.—al ional at e al items of ick or de	m. l others ar extra cost. f equipment elivery wa	e 4 cyl. o n—pne it. b—j	d—dual teumatic terrice inclused the constant of the constant	ires. ires.	Kimball AF *Kissel Express Kissel Utility Kissel Freightet Kissel H.D Kleiber A	5 1 11/2 21/2 4 1	5500 1585 1975 2875 3675 2200 3100	5 x6 37/8x51/2 37/8x51/2 41/4x51/2 41/4x51/2 41/8x51/4	36x6 84x5n 36x3 ¹ / ₂ 36x4 36x5 34x3 ¹ / ₂	40x7d 34x5n	W W W W

Specifications of Current Motor Truck Models—Continued

~	Specifications of Current Motor Truck Models—Continued																		
NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear	Final Drive	NAME - AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear Print
Kleiber BB	21/2 31/2 5 11/2 21/2 31/2 5 3/4 1 11/2 21/2 31/2	3175 3275 4470 3275	41/4x51/4 41/2x51/2 41/2x51/2 x61/2 31/2x51/2 4 x51/8 4 x51/8 4 x51/8 4 x51/8 4 x51/8 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2	36x4k 35x5k 36x6 34x3½ 36x4 36x4 36x4 36x5 36x4 34x5 36x4 36x4 36x4 36x4 36x5	36x7k 36x5d 40x12 34x5 36x7 36x7 36x7 34x4 36x7 34x5 36x7 36x8 40x10 40x6d	W W W W W W W W W	Ogden. A2 Ogden. D Ogden. D Ogden. D Old Reliable A Old Reliable B Old Reliable S Old Reliable C	122355712235522235522235522235522235522235522235522235522235522235522235522235522235522235522235522235522235522235522235522223552222355222235522223552222355222235522223552222355222235522223552222355222235522223552222235522222355222222	\$2350 3500 4250 5000 6000 1095 3200 2825 3200 4050 4725 2485 2585 3485 2585	31/x5 33/x5 33/x5 4 x5 41/x60 43/x61 43/x61/4 41/x51/4 41/x51/4 41/x51/2 41/x51/x51/x51/x51/x51/x51/x51/x51/x51/x5	36x3½ 36x3½ 34x4 34x4 36x5 36x6 35x5n 36x4 36x3½ 36x4 36x5 36x6 36x6n 38x7n	36x5 36x6 36x6 36x4d 36x5d 40x6d 40x7d 35x5n 36x8 36x7 36x8 36x10 40x12 36x6n 36x6n 38x7n	W W W W W W C I W	Selden	5-7 34 114 112 2 3 31/2 4 6 1 11/2 21/2 3 31/2	\$3750 4950 1330 1695	434x6 314x412 334x512 312x512 4 x512 414x512 414x512 414x512 414x512 414x512 414x512 414x512 414x512 414x512 414x512	36x5 36x6 32x4½n 34x5n 34x5n 36x3½ 35x5n 36x4 36x5 36x6 34x5n 34x4 36x5 36x6 34x5 36x6 34x4 36x5 36x6 34x4 36x5 36x6	36x10 W 40x12 W 32x4½n B 34x5n B 34x5 W 36x7 W 36x8 W 36x5d W 36x5d W 36x5d W 36x5d W 40x6d W 30x6 W 40x6d W 30x6 W 30x7
Larrabee. X-2 Larrabee. U Larrabee. J Larrabee. K-5 Larrabee. K-5 Larrabee. L-4 Larrabee. W	10/2-0	1925 2400 2400 2100 3450 4000 4800	314x41/2 334x5 334x5 41/8x51/4 41/2x51/2 41/2x51/2 43/4x6	34x5n 34x3½ 34x3½ 36x4 36x4 36x6 36x6	34x5n 34x5 34x5k 36x7 36x8 36x5d 40x6d	B W W W W	Packard EC Packard EX Packard EX Packard EX Packard EF Paige 52-1)	2-3 2-21/2 31/41/5-71/2	3585 425 3100 3100 4100 4500 1950	4 x51/8 33/8x4 4 1 x51/2 4 1 x51/2 4 1 x51/2 4 x51/4	36x4 36x6n 36x5 36x6 34x3 ¹ / ₂	36x7 40x8n 36x5d 40x3d 31x5	B W W W W	Standard 76 Standard 65 Standard 5-K Sterling 1½ Sterling 2½ Sterling 3½ Sterling 5-W Sterling 5-W	2½-3 3½-5 5-7 ½ 1½ 2 2½ 3½ 5	2796 3645 4495 610b 2885 3085 3290 4325 4950	11/8x5/4 11/2x5/2 13/4x6 31/8x4/4 4 x5/4 4 x5/4 4 x5/4 13/8x5/4 11/2x6/4 5 x6/4	36x4k 36x5 36x6 30x3½ 36x3½ 36x4k 36x4k 36x5k 36x6	36x8 W 36x12 W 40x14 W 30x31-2n 36x5k W 36x6k W 36x4dk W 40x5dk W 40x6d W
Maccar . L. Maccar . H-A Maccar . H-2 Maccar . M-3 Maccar . G MacDonald . A Mack . AB Chain Mack . AC Chain	2 3 4 5 6 7 1 2 2 2 2 2 2 2 2 2 2 2 5 5 6 7 7 5 5 6 7 7 7 7 7 7 7 7 7 7 7 7	5750 3450 3300 3750 3850 3100 4950 55500 5750 6030 3400	11/8x51/4 11/8x51/4 11/9x51/2 11/9x51/2 11/9x51/2 11/9x6 11/9x5 1	36x4 36x4 36x5 36x5 36x5 40x7 36x4k 36x4k 36x4k 36x4k 36x4k 36x5 36x6 36x6 36x6	36x6 36x5d 36x5d 40x6d 40x11 36x3½ 36x4dk 36x4dk 36x4dk 36x4dk 40x5d 40x5d 40x5d 40x5d 40x5d	dk D C D D C	Paige 51-28 Paige 51-18 Parker C-22 Parker G-22 Parker J-20 Parker M-22 Patriot Revere Patriot Lincoln Patriot LS-800 Patriot Washgi'n Pierce-Arrow Pierce-Arrow Pittsburgher Power F Power C Premocar B-143	31/2 1 21/2/2 5 1 2 2 3 1/2 2 3 1/2 2 3 1/2 2 3 1/2 2 3 1/2 2 3 1/2 2 3 1/2 3	2420 3145 1875 3200 3950 4850 2050 2175 2900 4350 4850 3000 3890 3150 2475	41/4x51/2 41/4x6 41/4x6 41/2x6 53/4x5 4 x51/4 4 x51/4 41/2x63/4 41/2x63/4 41/2x63/4 41/2x63/4 41/2x63/4 41/2x63/4 41/2x51/2 41/2x63/4 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2 41/2x51/2	34x4 36x5 34x5n 34x4 36x5 35x5n 34x4 36x5 36x5 36x4 36x5 36x5 36x5 36x5 36x5 36x6 36x5 36x6 36x6	34x8 36x5d 40x5d 40x5d 40x5d 35x5n 34x6 36x7 36x7 36x4d 36x5d 40x6d 36x6 36x7 36x7 36x7 36x7 36x7	W W W W W W W W W W W	Sterling 5-C Sterling 7-½ *Stewart Utility Stewart 9 Stewart 9 Stewart 10-X *Stewart 1	11/4 3/4 1 11/2 2 3 2 31/2	6000 1245 1445 1790 2390 3190 1245 1095 1790 2150 2490 3150 2800 3750	5 x6\4 3 \(\) x6\4 3 \(\) x6\5\4 3 \(\) x5\5\4 3 \(\) x5\5\4 3 \(\) x5\5\4 1 \(\) x5\6 1 \(\) x6\6 1 \(\) x7\6 1 \	36x6 36x6 36x6 34x4½1 35x5n 34x3½ 34x4 36x5 34x4½1 34x5n 36x4 36x4 36x5 36x4 36x5	35x5n I 34x8 I 36x10 I 34x4½n B 34x4½n B 34x5n W 36x5 W 36x7 W 36x7k W 36x7k W 36x5d W
Mack Trac. AC Mapleleaf. A2 Mapleleaf. BB** Mapleleaf. BB** Mapleleaf. DD** Master. JW Maste	70 13 15 15 12 23 34 45 11 12 22 12 22 22 22 22 23 33 45 55 66 11 12 23 33 11 12 23 33 14 15 15 16 16 16 16 16 16 16 16 16 16 16 16 16	4950 55750 6030 3030 3030 3050 4050 4050 4290 2290 2290 3190 3290 4290 4290 4290 4290 3390 3390 3390 3390 3390 3390 3390 3	5 x6 5 x6 5 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	36x5 36x6 36x6 36x7 36x4 36x5 36x4 36x5 36x5 34x3 34x3 34x3 34x3 36x5	40x5d 40x6d 40x1d 36x6n 36x7 36x5d 40x6d 34x5 34x5 34x5 34x5 34x5 36x7 40x6d 40x6d 40x6d 40x6d 40x6d 40x6d 36x7 32x4n 36x5 36x5 36x5 36x5 36x5 36x5 36x5 36x5	CCCCWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	*Rainier R-21 Rainier R-28 Rainier R-28 Rainier R-28 Rainier R-18 Rainier R-18 Rainier R-18 Rainier R-18 Rainier R-18 Rainier R-19 *Reo F Reliance 100 Reliance 100 Reliance 100 Republic 11 Republic 11 Republic 11 Republic 21 Rowe CD.W Rowe CD.W Rowe G.S.W Rowe G.P.W Rowe F.W Rowe G.P.W Rowe F.W Rowe G.P.W Rowe F.W Rowe F.W Rowe G.P.W Rowe F.W Rowe F.W Rowe F.W Rowe G.P.W Rowe G.P.W Rowe F.W Rowe F.W Rowe F.W Rowe G.P.W Rowe G.P.W Rowe G.P.W Rowe F.W Rowe F.W Rowe G.P.W Ro	1 1 2 3 5 5 6 - 7 11 2 1 2 2 3 2 5 5 6 - 7 11 2 1 2 2 3 2 2 2 3 2 3 1 2 2 3 3 1 2 3 3 1	1970 2150 249) 2950 4400 3550 4400 1185 2400 1395b 1395 1695 1795 3095 3090 4150 4500 4850 795 1295 1395 1295 1295 1295 1295 1295 1295 1295 12	31 2x5 33 4x5 33 4x5 11 2x5 11 2x5 12 2x5 12 2x5 12 2x5 33 4x5 33 4x5 4 1 2x5 12 2x5 33 4x5 4 1 2x5 4	35x5n 35x5n 34x34 34x4 36x5 36x6 36x6 36x4 36x4 36x4 36x4 36x4 36x4 36x5 36x4 36x5 36x4 36x5 36x5 36x6 36x5 36x	35x5n 35x5n 34x5 34x7 36x5d 40x6d 40x6d 40x6d 36x5 36x4 36x4 36x5 34x4 36x10 36x6n 36x6n 40x6d 40x6d 32x4 22x4 20x6 36x6d 40x6d 36x6	WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	Fraylor B. Fraylor C. C. Fraylor B. Fraylor F. F. Triangle A. Friangle C. Friangle C. Friangle C. C. Friangle C. Fria	11/2 2 3 1 11/2 3 31/2 11/2 2-21/2 3-31/2 5-6 11/2-2 2-21/2 31/2	1795 2109 2700 36004 4300 4500 2750 2700 36004 100 2000 2475 3475 1595a 1595a 1895a 1895a 1895 1495 2385 2386 2380 4700 1285 1985 2490 3300 4700 1285 1985 2485 2385	x51/4 1/8x5/4 1/8x5/	34x31/2 36x31/2 36x4k 36x4k 36x5k 34x31/2 36x4 36x4 36x6	36x7 I 32x4½n B 34x5k I 36x8k I 36x8k I 36x8k I 36x12k I 34x5 W 36x7 W 36x7 W 36x8k W 40x6d W
Nash 2018 Nash 3011 Nash 3018, LWf Nash 3018, LWf Nash 3018 Nash 5011 Nelson G Nelson G Nelson G Nelson G Netco HI Niles I. Noble A2 Noble B3 Noble D5 Noble B3 Noble B3 Noble B4 Noble B5 Noble B3 Noble B4 Noble B5	8 1-112 8 2-212 2-212 2-212 2-212 3 2-212 3 3 2-212 4 3 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1595 2150 2750 2200 2800 2250 3100 3500 1750 2395 2795	334x514 334x514 14x519 334x514 14x519 334x514 149x514	34x4 34x4k 36x6 34x4k 36x3 36x4 36x4 36x4k 36x4k 36x4k 36x4 36x4 36x4 36x4 36x4 36x4 36x4 36x4	34x5 34x7k 36x56 34x7k 36x6 36x7 36x6 40x6d 36x7k 36x8k 36x7k 36x8k 36x7 36x5 36x7		Schwartz Sch	5 2 3 3 2 5 5 3 5 2 5 7 1 2 3 4 1 5 5 1 1 2 2 3 3 1 2 3 3 1 2 3 3 1 2 3 3 1 2 3 3 1 2 3 3 3 1 2 3 3 3 1 2 3 3 3 1 2 3 3 3 1 2 3 3 3 3	3200 3800 4400 4600 5050 1685 3300 4900 4900 2250 3350 3250 4350	44\(\)\(\)\(\)\(\)\(\)\(\)\(\)\(\)\(\)\(30x4 36x5 36x5 36x5 36x6 34x4 36x4 36x4 36x4 36x4 36x4 36x6 34x31 2 36x6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	36x4d 36x5d 40x6d 36x7 36x5d 40x5d 40x7d 40x7d 34x4 36x7 36x8 40x12 34x5 36x7 40x8n ble Redi	W W W W W W W W	Ultimate	2 2 2 2 3 3 5 5 1 1 1 2 1 2 2 2 3 3 1 2 1 2 2 2 3 3 1 2 1 2	3150 3200 3250 3700 3800 5500 895 1445 1595 1795 3975 1575 1575 1475 2475 4475	4 x5/2 4/4x5/2 4/4x5/2 4/4x5/2 4/4x5/2 5 x6/2 3/2x5 4 x5 4/4x5/2 4/2x5/2 4/2x5/2 4/2x5/2 4/2x5/2 4/2x5/2 4/2x5/2 4/2x5/2 4/2x5/2 4/2x5/2 4/2x5/2 4/2x5/2 4/2x5/2 4/2x5/2	36x31/2 36x31/2 36x4 36x4 36x4 36x6 32x11/2 34x5n 34x5n 36x5 36x3 36x4 36x6 36x3/2 36x6	36x6 W 36x6 W 36x6 W 36x4d W 36x4d W 40x12 W 40x12 W 43x45a B 34x5a DR 34x8 DR 34x8 DR 36x5 W 34x5n W 36x5 W

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear	Final Drive	NAME AND MODEL	Tous	Chassia Price	Bore and Stroke	Front	Rear	Final Drive	NAME AND MODEL	Tons	Chassis Price	Bore and Stroke	Front	Rear E
Veteran. P** Veteran R** Veteran S** *Vim 50 Walker-JohnsonB Walter Malker-JohnsonB Walter S *Watson C Watson C Watson Western L1/2 Western L1/2 Western L2/2 Western W2/2 Western W2/2 Western W3/2 *Wite 15	3 4 8 4 2 3 2 5 1 3 1 1 2 2 2 3 3 1 1 2 2 2 3 3 3 1 1 2 2 2 3 3 3 3	\$3699 4200 5395 995 2500 3000 3850 4850 1465a 4250 2450 2450 3250 2450 4000 2400	41/4x51/2 41/2x6 4 x5 38/4x5 41/4x51/2 41/2x61/4 35/4x51/8 41/2x51/8	36x4 36x5 32x4n 36x4 36x4 36x4 36x4 36x4 36x3 36x3 36x3		W W W D W W W W W W W W W W W W W W W W	White 40 White 45 Wichita K Wichita M Wichita RX Wichita O	31/2 5 1 2 3 4 B-Gear, 't-2 as option to the several	w—Worz cyl.—all onal at en litems of	334x534 434x534 334x534 334x534 436x534 412x634 Chain, n. others are extra cost. equipment	D—Dou 4 cyl. d- n—pneu b—pi	36x8k 36x5k ble Redu	D W W W W W	Wilcox. D Wilcox E Wilcox F Wilson. F Wilson. G Wilson. G Wilson. H *Wisconsin. A Wisconsin. B Wisconsin. B	11/2 21/2 31/2 5 5 11/2 21/2 31/2 5 1 11/2 21/2 31/2	\$1900 2550 3000 3950 4350 2270 2825 3685 4620 1750 2100 2700 3000 4000 4000 2450 2900	41/4×5	36x4k 36x4 36x4k 36x5k 36x5 36x3 36x5 36x6 34x5n 35x5 36x6n 36x6n 36x6 36x6 36x6 36x6 36x6 36	36x4k W 36x5 ydk W 36x5 ydk W 40x6d W 36x5 W 40x6d W 36x5 W 40x6 W 36x7 W 40x6 W 34x5n W, 36x6 W 40x6 W 36x7 W 40x8 W 36x6 W 40x8 W 36x10 W 40x8 W 40x8 W 36x10 W 40x8 W 4

Specifications of Current Farm Tractor Models

TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Plow	TRADE NAME	Rating	Price	Wheels or Crawlers		Cylinders; Bore, Stroke	Fuel	Plow	TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders; Bore, Stroke	Fuel	Plow
Allis-Chal.G.P. Allis-Chalm Allis-Chalm Allwork2-G	6-12 15-25 20-35 14-28	\$295 1185 1885 1595	4	LeR. Midw. Own Own	4-31/8x41/2 4-41/8x51/4 4-43/4x61/2 4-43/4x6	Gas.	1 3 3-4 3	Gray	18-36	1975	3	Wauk.	4-43 ₄ x63 ₄	Gas.	4	OilPullE ¶OldsmarK	30-60 2½-5	\$225	4 4	Own Own	2-10x12 1-5½x5½	K,D Gas.	8-10
AllworkC ¶ARO.1921-22 Aultman-T, Aultman-T, Avery,SR.Cul. Avery Cult-C	14-28 3-6 15-30 22-45 30-60 5-10	1293	4	Own Own Clim. Own Own Own Own	1-4 ¹ / ₂ x5 4-5 x6 ¹ / ₂ 4-5 ¹ / ₂ x8 4-7 x9 4-3 x4	Gork Gas.	6	Hart-Parr 20 Hart-Parr 30 ;Hart-Parr Heider C Heider C Heider Cult	20 30 9-16 12-20 5-10	628 725	4	Own Own Own Wauk. Wauk. LeR.	2-5½x6½ 2-6½x7 6½x7 4-4½x5¾ 4-4½x6¾ 4-3½x4¼	G,K G.K.	2 3 2 3 1	PioneerG PioneerC	18–36 40–75			Own Own	4-5½x6 4-7 x8	G,K,D Gas.	4 10
Avery	12-25 14-28 8 6 25-50		4 4 4 4 4	Own Own Own Own Own Own	6-3 x4 4-4x5½ 2-6½x7 4-45%x7	G,K G,K,D G,K,D G,K,D G,K,D G,K,D	2-3 3-4 4-5 5-6	Huber Light, 4 Huber Super 4	12-25 15-30	985	4 4	Wauk. Midw.		Gas.	3	Russell Russell Russell Russell	12-24 15-30 20-35 30-60		4	Own Own Own Own	4-4 ¹ / ₄ x5 ³ / ₄ 4-5x6 ¹ / ₂ 4-5 ¹ / ₂ x7 4-8 x10	GorK GorK	2-3 3-4 4-5 8-10
Avery	45-65	****	4	Own	4-7¾x8	G,K,D	8-10	International Internatl.Titan International	8-16 10-20 15-30		4 4 4	Own Own Own	4-41/4x5 2-61/2x8 4-51/4x8	G,K,D G,K,D G,K,D	3	Shaw-Enochs			2	LeRoi	4-31/6x41/2	Gas.	
Bates All-StID Bates Mule, H Bates Mule, F ‡BatesMule, G Bear	15-25 15-25 18-25 25-35 25-35			Own Midw. Midw. Midw. Ste.	4-41/4x6 4-41/6x51/4 4-41/6x51/4 4-41/2x6 4-43/4x61/2	Gas. Gas. Gas. Gas.	3 3 3	¶Kinkade	11/2-3	190	1	Own	1–3 х3	Gas.		(Grader)	6-10	675	3	LeR.	4-31/8x41/4	Gas	2
Bear. Beeman Jr. Beeman . G Best	34-11/2 2-4 18-30	180 240 2500	2 4 *2 *2 4	B&S Own Own Own B&S Own	1-21/2x21/2 1-31/2x41/2 4-43/4x61/2 4-61/2x81/2 1-21/2x21/2 2-4 x5	Gas. Gas. G,K,D G,K,D		Lauson5 Lauson21 LeaderB LeaderN	15-30 12-18 16-32	1295 1675		Own Own Midw. Beav. Own Clim.	2-4 x6 2-6 x7 4-4½x5½ 4-4¾x6 2-6 x6¼ 4-5 x6 4-5 x6	GorK G,K,D G,K	1 3 3 3–4 2–3 3–4	Townsend Townsend Townsend Townsend Traylor Twin City Twin City Twin City	10-20 15-30 25-50 6-12 12-20 20-35 40-65	800 1350 2500 500	2 2 4 4 4	Own Own Own LeR. Own Own	4-6½x7 4-7 x8 4-8½x10 4-3½x4½ 4-4¼x6 4-5½x6¾	Ker. Ker. Ker. Gas. H,K	2-3 3-4 4-8 1-2 3 5-6 8-10
Case	12-30 15-27 22-40 40-72 25 40 5-2½	1250 1490 2650 5200	4 4 4 *2 *2	Own Own Own Own Own Own Own N Way	4-41/8x5 4-41/2x6 4-51/2x63/4 7 x8 4-43/4x6 4-61/2x7 2-21/2x5	G,K,D G,K,D G,K,D G,K,D Gas. Gas. GorK	3-4	Little Giant A	15-30 16-22			Clim. Buda Own Own Wisc.	4-0 x6 4-41/x8 4-41/x5 4-51/x6 6-53/4x7	G,K G,K K K Gas.	3-4 3 4 6 16	Uncle SamC20 Uncle SamB19 Uncle SamD21 Utilitor501 Utilitor501A	12-20 20-30 20-30 21/3-4 21/3-4	1985 1985	4 4 4	Weid. Beav. Beav. Own		GorK GorK	2-3 3-4 3-4 1 1
Cletrac F Cletrac W Do-It-All A Do-It-All Jack Do-It-All 6	3-6		*2 *2	Own Own Own Own	1-41/2x5 1-35/2x5 1-35/2x5 1-35/2x37/2 2-33/2x37/2	G,K,D G,K,D Gas. Gas.	2 2-3 1 1 1	MerryGar1922 Minne All-P Minne Gen.P Minne. Med.D MinneHeavyD Moline Univ D Moline Orch	17-30 22-44 35-70	650	4 4 4	Own	1-25 8x2 \(\frac{1}{2}\) 4-4\) 4x7 4-4\) 4x7 4-6 x7 4-7\] 4x9 4-3\) 2x5 4-3\) 2x5 4-4\) 4x6	Gas. Gork Gork Gork Gork Gas. Gas. G,K,D	3 3-4 5-6 8-9 2-3 2-3 4	Wallis K Waterloo N Wetmore21-22 Wiscensin . E Wiscensin H	15-25 12-25 12-25 16-30 22-40	1185 1750	4 4 4	Own Own Wauk. Clim. Clim.	4-4 ¹ / ₄ x5 ³ / ₄ 2-6 ¹ / ₂ x7 4-4 x5 ³ / ₄ 4-5 ¹ / ₂ x7	Ker. G,K GorK	3 3 3 4-6
Eagle F Eagle H E-B AA E-B Q	16-30 12-20 12-20		4 4	Own Own	2-7 x8 2-8 x8 4-434x5 4-434x5	Gork Gork G,K,D	3	Nichols-Shep.	20-42 25-50	3000	4 4	Own	2-33/4x4 2-8 x10 2-9 x12	GorK GorK	1 3-6 4-8		15-25 25-40			Wise. Wise.	4-41/4x6 4-53/4x7	G,K,D	::
Fageol D Fordson Frick A Frick C	9-18 -18 12-20	39	5 4 4 4	Lyc. Own Erd.	4-51/4x7 4-31/2x5 4-4 x5 4-4 x6 4-43/4x8	Gas. G.K G.K G.K	2 2 2-3 3 4		16-30)	4 4	Own Own	2-10½x14 2-6 x8 2-7 x8½ 2-8 x10	K,D K.D	8-12 3 4 5-6	ABBREVI Distillate. P. tions. Figure —Beaver. B. —Continenta Hercules. L. Way. Nor.—	low cap	acity	varies	in rela		ating co	ondi-

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Specifications of Current Passenger Car Models *

		PRIC	CES		-	9				£ ~		١.	7		1		**		1 3
2-Pass.	5-Pass.	7-Pass.	Spert	Ceupe	Sedan	Wheel Base	Tires	Engine Make	Cylinders Bore and Stroke	Power (N.A.C.C	NAME AND MODEL	Carbureter	Starting a Lighting	Ignitien	Clutch: T and Make	Gearset	Universal Type and Make	Rear Arie Type and Make	†Gear Ra
\$1995c	\$1785 1650 1195	\$1850	\$1885 c		\$2485 (1450d 1595d	127 127 114	33x4½ 33x4 32x4	H-S Own Cont	6-3½x5 2- 6-3½x4¼	29.40	AmericanD-66 AmericanSteamer Anderson41	Strom None Zenith	G-D L-N West	A-K L-N West	s-p B&B None s-p B&B	None	m Hartford f Universal.	F Salis Own. 1/2F Salis	4.50 1.75 4.62
1495	1495	1595	1785b 1915c	\$19 95e			33x4	Cont	6-33/8x41/2	27.34	AndersonSeries 50						f Universal.		1
	1535 2800	2900	(1005.	3625	(3850f 13750d	114 130	32x4½ 34x4½ 32x4	Own	6-31/8x41/2 8-31/4x5 6-33/8x41/2	23.44 33.80 27.34	Apperson				m-d Own				
(1275	1345	1895c 1995n	1965‡ 1025a	2245 1465		31x4	Cont	6-31/8x41/4	23.44	Auburn6-43	Strom	Remy	Remy	s-p B&B	Warner.	mg	½F Col	4.70
865	1395 885	725g	1495d	1175	1850d 1395 1325	122 118 109	32x4 ¹ / ₂ 32x4 31x4	Cont . Own.,	6-31/4x5 6-31/8x41/4 4-33/8x43/4	25.35 23.44 18.23	Auburn	Strom	Remy Delco	Remy Delco	s-p B&B s-p B&B	Warner. Fuller	f M&E	1/2F Col	4.58 4.66
1175	1195	975g 1435	(1625a \1675c	1935 1895	1985 2195	118 124	33x4½ 33x4½		6-33/8x41/2 6-33/8x41/2	27.34 27.34	Buick 1923-41-4-5-47 Buick. 1923 48-9-50-4-55	Marvel Marvel	Delco	Delco	m-d Own m-d Own	Own Own	m Own m Own	F Own	
2885	2885	2885		{3675 {3750d		132		Own	8-31/8x51/8	31.25	Cadillac61	Own	Delco						Opt.
1750b	1790	1990	2230d 1950c		2575 2975b 1585d	122 129 117 122	32x4½ 34x4½ 32x4 32x4		6-3 ³ / ₈ x4 ¹ / ₂ 6-3 ⁵ / ₈ x5 ¹ / ₄ 6-3 ¹ / ₄ x4 ¹ / ₂ 6-3 ¹ / ₄ x4 ¹ / ₂	27.34 31.54 25.35 25.35	Case	Rayfield. Strom Strom	A-L	Remy	m-d Own m-d Own m-d Own m-d Own	Own Own	f Arvac m Hardy m Hardy	34F Col 34F Adams 34F Adams	4.66 4.45 5.13 5.13
1595e 510	1395d 1695e 525	1545 425g		1695d 840c	2195d 12295 f 860	123	33x4 30x3½	Own	6-3½x5 4-3¼x4	29.40 21.76	ChandlerSix ChevreletSuperior		Remy		s-p B&B c Own			F Own	
710	725	625g		680k 1040c		103	30x3½		4-3½x3½		ChevroletM	Holley .	A-L		m-d Own		m Mech	½F Own	
1085b 1885	995	1885	1260d 1885e	(2585b) (2685d)	1485d 2685 f	112½ 127¼	31x4 33x5	Own Nort	6-3-4x4½ 8-3½x4½	22.50 39.20	Cleveland		Bosch Delco	Bosch Delco	s-p B&B m-d North	Own Own	m Mech m Spicer	1/2F Own 3/4F Col	4.90 4.70
995	1475		1395d	1995c 1235a	1995d 1395d	115 115	32x4 31x4	Cont	6-3\%x4\\\2 6-3\%x4\\4	27.34 23.44	ColumbiaBig Six ColumbiaLight Six	Strom Strom	A-L	A-K A-L	8-p B&B 8-p B&B	Durston. Durston.	m Spicer m Spicer	1/2F Tim 1/2F Tim	4.75
1195	1235		(1495b 1565c		2055d	116	32x4	Falls.	6-31/8x41/4	23.44	Courier	Strom	West		s-р В&В			34F Col	
		3000	3500c	•••••	4500 4250c	138 138 142	33x4½ 33x5 33x5	Cont Cont	6-35/8x51/4 6-35/8x51/4 8-33/4x5	31.54 31.54 45.00	Crawford23-6-60 Crawford-Dagmar6-70 CunninghamV	Zenith Zenith Strom		Besch	m-d B-L m-d B-L m-d Own	B-L	m Spicer m Spicer f Spend	1/2F Tim 1/2F Tim F Tim	
4350b 1495b 1595 850	4350e 1295 1595 880	4350	43 50c 1495c 1695			132 115 120 114	33x5 31x4 32x4 32x4	Own Cont Cont	8-3½x5¼ 6-3½x4¼ 6-3¾x4¼ 4-3¾x4½	39.20 23.44 27.34 24.03	Daniels 23-38 Davis 71 Davis 63-65 Dodge Brothers	Strom Strom	Delco Delco Delco N.E.	Delco Delco	m-d Own s-p B&B s-p B&B	Own Warner Warner	m Spicer m Peters m Peters	F Tim	4.23 5.10 5.15
865	3950e 865	3950	4150c (1015a		1195h 5750f ∫1370	132 108	33x5 31x4	Own D-Ly.	6-4 x5 4-31/2x5	38.40 19.60	Dorris6-80 Dort19-14	Strom	West Bosch	Bosch	m-d Own m-d Detlaff	Warner	m Spicer	1/2F Tim	4.23
990	990		1015d	1020k 1145	1070k 1195	115	31x4	Falls	6-31/8x41/4	23.44	Dort25-20		Bosch		m-d Detlaff			1	
5750 .890	5500 890	5900	5750 1095e	1365 7250c 1365 1465‡	1365	134 109	33x5 31x4	Own Cont	8-27/8x5 4-37/8x41/4	26.45 24.03	DuesenbergStraight 8 DurantA-22	Strom Till	Delco	Delco A-L	s-p Own	Own Warner	f Climax m Spicer	1/2F Own 3/4F Adams	4.45
1600 1485 1395	1650 1095 965 1395 1045 1195c		1165d	2250 1795e 1995‡ 1145 1895c	2400 1795d 1425d 1995 1245k 1985d	123½ 112 112 118 108½ 120	32x4½ 32x4 31x4 32x4 32x4 32x4½	Anst Own Lyc Cont Own	6-3 ¹ / ₄ x4 ¹ / ₂ 4-3 ¹ / ₄ x5 ¹ / ₄ 4-3 ⁵ / ₈ x5 6-3 ¹ / ₄ x4 ¹ / ₂ 4-3 ³ / ₈ x5 6-3 ³ / ₈ x5	25.35 18.91 21.03 25.35 18.23 27.34	Durant B-22 Earl 40 Elcar 4-40 Elcar 6-60 Essex Flint	Scoe	A-L Delco Delco Bosch A-L.	Delco	s-p Ansted s-p B&B s-p B&B m-d Warner. m-d Own s-p m-d Own	Worner	f Own	3/F Solio	4.87
269 r 3900	298s			530 4900	{595 {725 4900d	100 132	30x3½ 32x4½	Own	4-33/4x4 6-33/6x5	22.50	FordT	Own Zenith	Own	Scintilla	m-d B-L	B-I.	m Spiner	14F Tim	4 90
1900 965 490	1950 965 490		1065c	2750c		115 112 100	32x4	Own	6-314x4 4-314x5 4-358x4	25.35 21.76 21.03	Franklin	Own Carter Scoe	N.E West	A-K West	s-p B&B s-p B&B m-d Own	Own Mech Own	m Spicer m Mech m Mech	12F Own 14F Flint 12F Tim	4.73
2250	2250c 2650		19701	2600	‡2850d	120 126	32x4½ 32x4½	Midw.	4-3%x5½ 6-3½x5 6-31/8x4¼	22.50 29.40	H.C.SSeries 4 H. C. SSeries 6 Handley6-40	Stromb.	Delco	Delco	m-d B-L m-d B-L	B-L	m Spicer	34F Own	
1350 1595	1595	2150	1350d 1695c	2475c	2585d	115 125 121	32x4 ¹ / ₂ 32x4 ¹ / ₂ 32x4	Cont	6-33/6x5	27.34	Handley6-60		Bosch	Delco	m-d Mech m-d s-p B&B	G-L	m m m Universal	Tim F Tim F Tim	4.90
2395	1345 1775 p2550e	1345c 1795 (2395	1975d	1950 2175 (3095	1950 2275 33951	115 121 132	32.4 32x4 33x5	H-S Own	6-3 ³ / ₈ x4 ¹ / ₂ 4-3 ¹ / ₂ x5 6-3 ¹ / ₄ x5 6-3 ⁵ / ₈ x5 ⁸ / ₁₈	19.60 25.35 31.54	Hatfield	Stromb	Dynety Bosch L-N	Bosch	s-p B&B s-p B&B m-d Warner.	G-L	m Spicer m Spicer	F Col	4.66
{1545 189 5 p	∫1595 \1850p	(2550p		13250p 2395p	(2595 2695p	121	32x4½	Own."	6-3½x5	29.40	Haynes55		L-N		m-d Warner .			-	
	2500c 1425c	2500 1475		3300c 2570c	3600f (1525k 2095	126 126	34x4½ 34x4½	Own	6-3½x4¼ 6-3½x5	29.40 29.40	HolmesSeries 4 HudsonSuper 6		Dyneto Bosch	Bosch	m-d B-L m-d Own	B-L Own	m Peters m Spicer	1/2F Tim 1/2F Own	4.90 4.4i
1115	1115	•••••	{1215a 1215d	\1535c	1675d	112	32x4	Own	4-31/4x51/2		HupmobileSeries R	Strom	West	A-K			m Universal		
995b 1895	995 1795		1095d 2150e	1445e 2485e	1465d 2485d	112 120 1241/2	31x4 32x4 32x41/2	Own Own	6-31/4x5 6-31/4x5 6-31/4x43/4 6-31/2x5	25.35 26.34 26.34	JewettSix JordanMX JordanH	Strom Strom	Remy Delco	A-K Delco	m-d Long m-d Detroit m-d Detroit	Detroit	m Spicer	1/2F Tim 1/2F Tim	4.42
1595 1795	1150 1595 1795	1595e 1795e	1895e 1995e	2200c 2500	1450 1995 2625	111 120 124	32x4 32x4½ 32x4½	Gray Own	4-3 ¹ / ₂ x5 8-3 x5 8-3 x5	19.60 28.80 28.80	Kelsey 4 King LL King L	Scoe Ball&B Ball&B	Bosch West						
	1485 1885	2385	1685d 2385c	2585‡ 2975¢	2285d 3075	121 124	32x4 32x4½	Own	6-3 4x5 1/8 6-3 4x5 1/2 8-3 1/4 x5 1/4	26.34	Kissel	Strom	Remy	Remy	s-p Detroit s-p Detroit m-d m-d Warner . m-d Own		m Spicer	F Tim.	4.40
3985 1795	4090c {1795 2095	4090 (1795 (2195	2045d {2145d	5500e {2445e {2745‡	5500f 2245d 2645d	132 123	33x5 32x4½	Anst.	8-31/4x51/4 6-31/4x41/2	33.80 25.35	LaFayette23		G-D	Delco	m-d Own m-d Own	Own	m Own	E Own	14.35
1575	1395		1575	{2085 1695k	2245	117	32x4	Own	6-3½x5	23.44	Liberty10-D		1	1	s-р В&В				
3800 8690	3800c 9500c			4400d	{4900f {4700d 12200 f	136 142	33x5 35x5	Own	8-33/6x5 6-41/2x51/2	36.45 48.60	Lincoln Series 8		Delco	1	m-d Own			1	
30,70	50000	5000	{		11600 f	170	0000	wd	0 1721072	10.00		Dance D.	11 000	Deleo	in-u_Own	OWII	di Own	r own	

MISCELLANEOUS

MISCELLANEOUS

a—2 Passenger,
b—3 Passenger,
c—4 Passenger,
g—Chassis Price,
h—All Metal Type,
k—Soft Top Type,
n—Tire Size 32x44,
p—Sport.
r—Price without starter and demountable rims. Price, complete, \$364.
s—Price without starter and demountable rims. Price, complete, \$393.
\$48tandard Phaetons.

ENGINE

ENGINE
Anst—Ansted
Cont—Continental
D.-Ly—Dort Lycoming
H.S—Herschell-Spillman
Lyc—Lycoming
Nort—Northway
Walk'r—Walker
Weid—Weidely

CARBURETOR
Ball & B—Ball & Ball
Till—Tillotson
Strom—Stromberg
Y & T—Yale & Towne

CLUTCH
c—Cone
m-d—Multiple disc
s-p—Single plate
B & B—Borg & Beck
B-L—Brown-Lipe
North—Northway

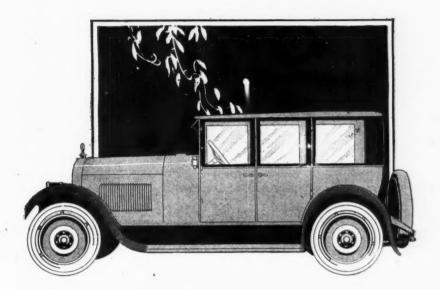
(Continued on page 88)

STARTING, LIGHTING
IGNITION
A-L—Auto Lite
G-D—Gray & Davis
L-N—Leece Neville
N. E.—North East
West—Westinghouse

UNIVERSAL, t—fabrie m—metal M &E—Merchant & Evans Mech—Mechanics

REAR AXLE
F—Floating
1/2 F—Semi-Floating
1/2 F—Semi-Floating
1/3 F—Three-Quarter
Col—Columbia
Salis—Salisbury
Tim—Timken

The Price—(and of course the car) that proved the Shows' sensation!



Coachbilt Anderson Aluminum Body; 6 Cylinder Red Seal Continental Motor; Westinghouse Starting, Lighting and Ignition; Borg & Beck Clutch; Cord Tires; Alemite Lubrication; Snubbers; Motometer; Wind Shield Cleaner; Wind Shield Shade; Foot Dimmer for Headlights; Cowl Ventilator; Heater; Foot Rest; Vanity Set; Dome Light; Reading Lamp. Average 19 miles per gallon of gas; Wheelbase 115 inches; Color—Maroon body with black mud guards.

The Sedan only \$1595

Touring Car \$1195 Coach \$1450 f.o.b. factory Direct-with-factory contract with maximum discount. Ask about it. Anderson Motor Co., Rock Hill, S. C.

The Coachbilt

ANDERSON

ALUMINUM SIX

A

Specifications of Current Passenger Car Models

		PRI	CES			Base	1		19	Horse		1 .	and		ype	1	40	1 :	
2-Pass.	5-Pass.	7-Pass.	Sport	Coupe	Sedan	Wheel Ba	Tires	Engine Make	Cylinders Bore and Stroke	Power (N.A.C.C.)	NAME AND MODEL	Carbureter	Starting a Lighting	Ignition	Clutch: Ty and Make	Gearset	Universal Type and Make	Rear Ards Type and Make	+Gear Rati
	(3435e (3185e	\$3185	\$3385a	\$3985	4385 f 4385 c	136	32x416	Own	6-3%x51/8	33.75	Marmon34	Strom	Delco	Delco	m-d Own	Own	m Spicer	34F Own	3.78
900	925			985	1335	109	31x4	Own	4-35/ax11/2	21.03	Maxwell	Stewart.	Remy	Remy	e Own	. Own	f Own	1/2F Own	4.60
5400	4550g	5700	5600c	6720 9000f	6720c 6810f	140		Own	6-4½x6	48.60	McFarlan1923		West		m-d M&E		m Peters	F Tim	1
3950b 37 5 0c	3950c 3750e	3950e	3750c	4850 4700†	5250e 5000e 5000e	132 132	32x4½ 32x4½	Own	4-3%/x614 6-3%/x5	22.50 33.75	Mercer	Ball&B Strom	West	Eisemann Eisemann	m-d Own m-d Own	Own	m Spicer m Spicer	F Own	3.87
1895 1490b	1895 1590		1850e	2050e		119 120	32x4	Cont	6-31/4x41/2 6-31/2x5	25.35 29.40 29.40	Merit		Delco Remy	Delco Remy	s-p B&B s-p B&B	Muncie	f Suead m Own	F Col F Own	4.60
	1295	1690	1145d	1585e	1695 1895p	127 115	32x4½ 31x4	Own	6-3½x5 6-3½x4¼	29.40 23.44	MitchellF-50 Moon6-40	Strom	Remy Delco	Remy Delco	s-p B&B s-p B&B	Own Warner	m Own m Own m Spicer	F Own	4.42
	1785		1995	2585с		128	33x4½		6-33/4x41/2	27.34	Moon6-58	Strom	Delco	Delco	s-р В&В	B-L	m Spicer		5.09
915	1240	1390	1645c	1890c		121 127	34x41/6	Own	6-31/4x5 6-31/4x5	25.35 25.35	Nash691-3-6-7 Nash692-4-5		Delco	Delco	8-p B&B	Own	m Own m Own m Own	1/2F Own	4.50
915 2475b	935 2475e	[2375	2485d	1385b 1195k 3250e	1545d 1275k 3285f	112	33x4 32x4½	Own	4-33/gx5 6-31/gx51/4	18.23 29.40	Nash		West		s-p B&B s-p B&B		m Own m Universal.		4.88
א	1485	3150		\3725e 1785d	1885d	121	1	Cont	6-33/8×41/2		National6-51		A-L		з-р В&В				
2500	795 2500^	2600e			1095d 3500d	112 128	32x41/2		6 6-33/8x41/2	27.33	National6-31 Noma4C	Zenith	Delco	Delco	s-р В&В	Detroit.	m Spicer	1/2F Tim	4.45
975 1145p 955	995	795g 13 5 0d		1445d 1185a 1475	1515 1595	115		Own	6-211x43/4 4-311x51/4	18.99 21.86	Oakland6-44 Oldsmobile43 A	Marvel	Remy	Remy	e Own s-p B&B		m Mech	F Own	4.33
	18 50 e	1735		(1195a	2635 f	122	33x4½	Own	8-27/6x43/	26.45	Oldsmobile46	Ball&B.	Delco		c Own		m Own m Spicer	%F Own	4.70
1625 525	1375 525	0050	1675e 425g	1875b 795	2025d 860d	115	32x4 30x31/2	Own	8-27/8x41/2 4-33/8x4	26.45 18.23	Oldsmobile47 Overland91	Till	A-L	Conn	s-p B&B s-p B&B	. Muncie . Own	m Own m Own	34F Own	4.50
2485	2485 2350g	2250g 2685	2650c	{3175c 3350d	3275d 3325d 3525f	126 133	33x4½		6-33/8x5 6-33/8x5	27.34	Packard		A-K	Delco	m-d Own			1/2F Own.	4.30
3850	3850c	3850		5240c	3575f 5400f	136		Own	12-3x 5	43.20	Packard335			Delco	m-d Own	Own	m Spicer	1/2F Own	4.36
2695b	2450с	2450		‡3135	3235d	131	33x4½	Cont	6-33/4x5	33.75	Paige6-70		Remy	A-K	m-d Long	Warner.	m Mech	½F Tim	4.45
1550 3300	1390 2990c	1425 2990		2395 {3400a	3235f 2395 3990d	120 128	32x4½ 33x5	Cont Own	6-33/8x41/2 8-31/4x5	27.34 33.80	Paterson22-6-52 Peerless23	Strom	Delco	Delco	s-p B&B	Durston.	m Hartford	32F Eaton.	4.50
5250	5250c	5250		(3550c 6800	409 f 6900c	138		Own	6-4 x5½		Pierce-Arrow	Own	Delco			1	m Spicer		1
575	1695 595	1745	1745	2445 895	17000f 2495 995	126 102	32x4½ 32x3½	H-S	6-31/4x5 4-3x41/2	25.35 14.40	Pilot6-50 PremierStrattan	Till Zenith	Bijur	Conn	s-p B&B Covert	Muncie.	m Hartford	34F Col	4.33
3150 1095	3100c 1095	3250		4300 1750	5100 1825	1263/4 117	32x41/2 32x4	Own Falls	6-33/8x51/2 6-31/8x41/4	27.34 23.44	Premier6-D Premocar6-40-A	Johnson.	A-L Delco Wagner	Delco	s-p B-B s-p B&B	Mech	m Spicer	3/4F	4.58
2485b	2585p	2485		3350	3550 f 3675 f	128 132	32x41	Anst	6-33/8x51/4 6-33/8x51/4	27.34 27.34 22.50	Princeton	Rayfield.	A-L	A-L	m-d Durant. m-d Durant.		m Spicer	1/2F Dur	. 5.12
	1665 2850	2900		2385e	2475d 3500d 3700 f	116 124	32x4 32x4½	Own	4-334x5 6-31/2x41/2	29.40	R & V KnightR R & V KnightH	Strom	Wagner	Wagner	s-p B&B s-p B&B	B-L	m Spicer m Spicer	F Salis	5.40
	1645	1485	1715	(1835e (2185‡	1885d	120		Own	6-378x5	24.34	ReoT6		N.E		m-d Own		m,f Own	½F Own.	4.70
2685 3685	1485 2485e 3485e	2685 3800	2750e 3650e	1885e 3 5 85	1985d 3585d 4650e	117 128 128	32x4 32x41/2 32x41/2	Own Cont	6-31/8x43/4 6-31/2x51/4 4-41/4x6	23.44 29.40 28.90	Rickenbacker A Roamer6-54-E Roamer4-75-E	Strom	Simms West	A-K Splitdorf	s-p Own s-p B&B m-d B-L	Warner G-L	m Universal f Snead f Snead	%F Col	4.63
3785	10900	10950			ſ13150	14316		Own	6-4½x434	48.60	Rolls-Royce40-50	Own	Bijur	Bosch				F Own	3.25
•••••				5100c 5250c	12900 5200e 5250	118	32x4	Own	4-23/4x51/4	12.10	Rubay	Stromb	Bosen	Bosch	s-p Own	. Own	m Universal	F Own	5.10
1645 875	1645 875			2645	2615	118 108	33x4 30x31/2	Cont	4-31/2x5	27.34 19.60	Sayers SixDP SenecaL-2 & O-2	Strom Zenith	Delco	Deleo	s-p B&B s-p B&B	G-L	m Arvae	F Peru.	
985 2750	985 2750	2503 2750	2500e		3400 3585d	112 127 130	30x31/2 31x4 34x41/2 32x41/2	Lyc Own	4-31/2x5 8-31/4x5 2-4 x5	19.60 33.80	Seneca50 & 51 Standard99	Zenith	West	Explitdorf	18-D B&B	. G-L	m Universal m Universal m Arvac	Lor Tim	4.50
319r	348s	285g	2425g	580	3985f 645	102				15.63	Stanley740		A-L				None		
2250 2700	2250 2700	2450 2850	2275c 2700c	3150e 3500e	3450f (3700f) 4500f	125 130	30x3½ 34x4½ 34x4½	Own	4-31/8x41/4 4-33/4x55/8 6-33/8x5	22.50 27.34	StarSKL4 Stearns-KnightSKL4 Stearns-Knight6	Rayfield. Rayfield	A-L West West	A-K A-K	m-d Own m-d Own	Own	Spicer f Climax f Climax	12F Own.	4.70
1345	1295		1985c		(1895d 1595d	117		Own	6-31/4×41/2		Stephens10						m Mech		
975b 1250	975 1275	1685 785g	2085c	1225b	2385 f 1550d 2050	124 112 119	33x4½ 31x4 32x4	Own	6-31/4x41/2 6-31/8x41/2 6-31/2x5	25.35 23.41	Stephens20 StudebakerLight Six StudebakerSpecial Six	Stromb.	Delco Wag.Remy	Delco Wag.Remy	s-p B&B s-p Own	Mech	m Mech f Thermoid.	1/2F Tim	5.50 4.55
1450g		1750	1000g ∫2400c		2750f	126	33x41/2		6-37/8x5	29,40 36.04	StudebakerBig Six	Strom	wag. Kemy	Wag. Remy	s-p Own	. Own	m Spicer m Spicer	12F Own.	4.50
1995	1995		\2550d		2550	120	32x4	Own	6-33/sx5	27.34	Stutz6 StutzKLDH	1	1		1		m Hartford.		
2450 1175	2790e 3165e 1175	{2640e {3015	2670a	3490	4450d	130	32x4½	H-S	4-4 ³ / ₈ x6 4-3 ¹ / ₂ x5	30.63 19.60	Tulsa E-1-2-3	Zonith	Dynato	Conn	an Dan	Munnia	_	E Colia	A 50
1275	1275 1990	p1565e		1795d	2095d	115 125	32x4 32x41/2	Own	6-31/8×41/2 6-31/2×51/4	23.44 29.40	Velie	Strom Rayfield	West Delco	A-K Delco	s-p Dooley. s-p B&B.	Durston. B-L.	m Thiemer m Peters m Peters	1/2F Own	4.66
2575	1690			2490‡ 1795	{2690d {2490d	120 121	32x4½	Cont	6-33/8x41/2	27.34	Westcott		1	1	1	1	1	1	1
	2475 2875e	2790		02100	3475 f 3850 f	127	32x4½ 32x4⅓	Own	8-31/4x4 8-31/4x4	33.80	Wills Sainte ClaireA-68 Wills Sainte Claire .A-68						m Mech		
1235	1235			(1695 c (1595 c		118	32x4	Own.,	4-35/8x41/2	21.03	Willys-Knight20	1	1	1			m Own f Own		- 10
3400	3600	1435 3400		4000	1995f {4550f 4700f		32x4½	Own	4-35/8x41/2 6-33/4x51/4	21.03 33.75	Willys-Knight 27 Winten 40	Till Rayfield	A-L Delco	A-L Delco	m-d Own m-d Warner	. Warner.	f Own	F Tim	4.68

MISCELLANEOUS

d—5 Passenger e—6 Passenger, f—7 Passenger

MISCELLANEOUS

a—2 Passenger,
b—3 Passenger,
c—4 Passenger,
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ENGINE

ENGINE
Ansted
Bea—Beaver
Cont—Continental
Dues—Duesenberg
II-S—Herschell-Spillman
Lyc—Lycoming

CARBURETOR
Ball & B—Ball & Ball
Till—Tillotson
Strom—Stromberg

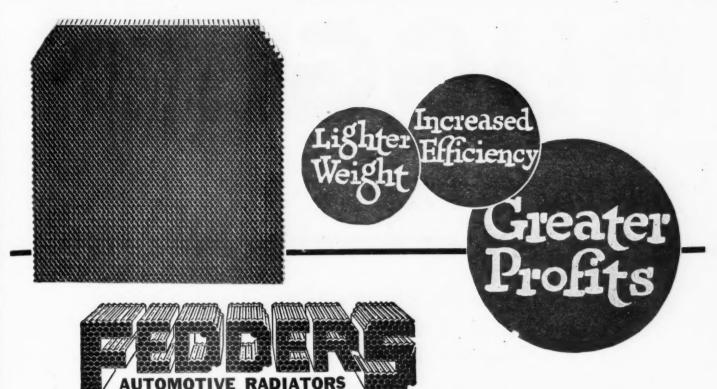
STARTING. LIGHTING
IGNITION
A-L-Auto Lite
G-D-Gray & Davis
I-N-Leece Neville
N. E-North East
West-Westinghouse
Wag. Remy-Wagner Remy.

CLUTCH
c—Cone
n-d—Multiple disc
s-p—Single plate
B & B—Borg & Beck
B-L—Brown-Lipe

GEARSET
B-L—Brown-Lipe
G-L—Grant-Lees
Mech—Mechanics

UNIVERSAL f-fabric m-metal M&E-Merchant & Evans Mech-Mechanics

REAR AXLE F—Floating—Semi-Floating %Footing—Semi-Floating %F—Three-Quarter Floating Col—Columbia Salis—Salisbury Tim—Timken



Are You going to get these profits—or let them go to a competitor? SOMEBODY's going to get them!

THERE'LL be 12,500,000 motor vehicles romping around the country this year. Most of them will be passenger cars—with radiators. There being only about 25,000 repair shops and service stations to take care of them, you should be taking care of 450 or more.

At least 5,000,000 of them will have run from 15,000 to 50,000 miles. Many will need new radiator cores.

Why not get at least your full share of this business? 200 or more radiator replacements is good business, worth being ready for. That's

what you're in business for, isn't it—to do business and make profits? This is a legitimate business, these are legitimate profits, that belong to you—business that you ought to do—profits that you ought to collect.

A supply of new FEDDERS Shallow Cores for Replacement will put you in line to take care of this business and get your full profits. These cores are light, compact, easy to handle, quickly installed.

And they are ALL of the Genuine FEDDERS Quality, which has been the Standard for 25 years.

Write for distributorship proposition, if you're in position to handle a considerable territory.

FEDDERS MANUFACTURING COMPANY, Inc.

Factory and General Offices-Buffalo, N. Y.

Branches and Distributing Agencies:

CLEVELAND
Fedders Mfg. Co., Inc.
3610 Superior Ave., N. E.

INDIANAPOLIS
Seth Klein Radiator Service Co.
820 North Meridian St.

NEW YORK Henry Jellinek Co., Inc. 364-366 W. 50th St.

DETROIT Olympian Radiator Repair Co. 218 W. Adams Ave. BALTIMORE
Enterprise Auto Repair Wks.
1908-1912 Frederick Avenue
SAN FRANCISCO, CALIF.
Feldmans Auto Metal Works
76 Eighth St.

RUGGLES

Right in 1922— Now Another Forecast

In April 1922 the Ruggles Motor Truck Company published an advertisement in this publication that said: "Ruggles dealers are equipping themselves for the increased truck demand that is surely coming. The business world thinks more of value than it has thought for years. It demands trucks that combine high quality and low price."

This statement was made when the business sky was dark. Many disbelieved it. Others accepted it and are now prosperous Ruggles dealers.

But history confirms the prophet. 1922 was a record-breaking year in automotive production.

Further—as predicted, value became the dominant sales point. Ruggles dealers dominate because they offer the greatest value for the money.

These dealers are firmly established and are ready for the increased prosperity that is now whistling for

> The World's Greatest Truck Value

TRUCKS

the crossing. If you doubted in 1922 believe us now.

We now predict that motor truck sales in 1923 will eclipse those of 1922. This is not a guess or an opinion but is a formal forecast based on figures on file in this office.

Ruggles dealers will get a large share of this busiiness because we have anticipated the situation and are prepared for it.

Ruggles dealers have the advantage of price, quality, service, appearance. They are supported by a financially sound factory. They have the sales help of an aggressive organization.

If you have the vision to see the wisdom of what is here said, you are the type of man who can profitably sell Ruggles Trucks. In this case we invite you to write or wire us for complete details.

RUGGLES MOTOR TRUCK COMPANY

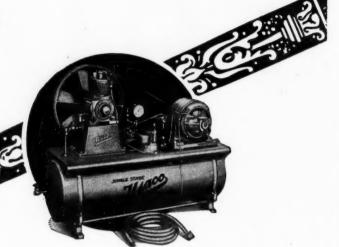
SAGINAW, MICHIGAN

Canadian Factory: Ruggles Motor Truck Co., Ltd., London, Ontario



The World's Greatest Truck Value Service

has been the vital factor in establishing prestige



An air compressor, to fully serve its purpose, must be instant in response, adequate to meet maximum requirements and absolutely dependable in operation.

To design a compressor that will maintain such service for a short time is an easy matter-to produce one that will do so day after day, for years to come, is a very different proposition.

In the face of keen competition, Usaco air compressors have maintained unapproached leadership; the name Usaco has become established as a word for quality in every city and hamlet in the country, and many of the most discriminating companies of national and international prominence have adopted these compressors as standard equipment.

Underlying this success has been the exceptional "Service" rendered—the inevitable result of inbuilt quality in every detail, highest standards of workmanship, fully automatic operation and specialized effort to build the world's best air compressor.

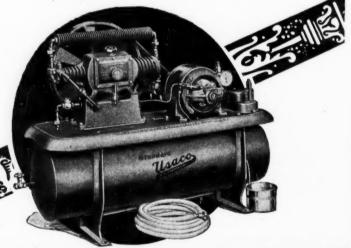
And Usaco quality will be yours whether you want a simple unit or a compressor of large capacity, two-stage or single-stage design, air or water cooled. The new Usaco "Perfect Balance" Service Tower is also a "knockout"made, in every respect, up to the high Usaco standard of quality.

Get the literature and all the facts.

The United States Air Compressor Co. 5304 Harvard Ave.

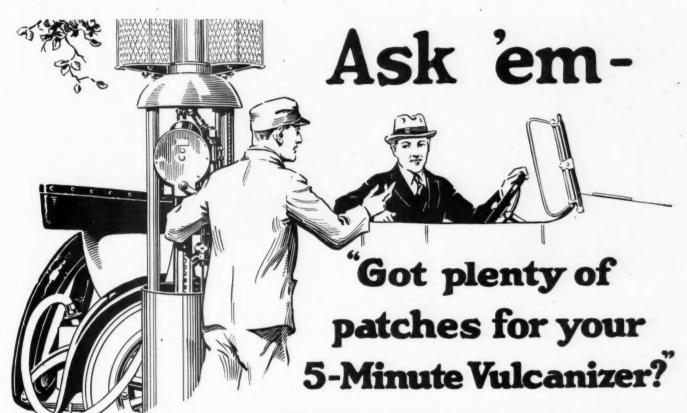
Cleveland, Ohio





Two Stage

Single Stage



Sold 50% of His Customers

"I followed out your suggestion, 'Have you plenty of patches for your 5-minute Vulcanizer?' and the results were wonderful.

"Our sales organization sold about 50% of the customers who came to buy other accessories, either a vulcanizer or patches.

"And the result is we are selling more 5-minute Vulcanizers than ever before. Words cannot express my gratitude for your sales helps and suggestions."

North End Auto Supply Chicago, Illinois When a motorist comes in to buy a spark plug, a tire—or while you are filling his tank with gasoline—ask him if he has plenty of patches for his 5-Minute Vulcanizer. He will in all probability need a supply of patches and will appreciate the reminder—or if he is one of the few who has no Shaler 5-Minute Vulcanizer he will tell you so and give you an easy opportunity to make a sale.

Every Sale Brings Repeat Sales

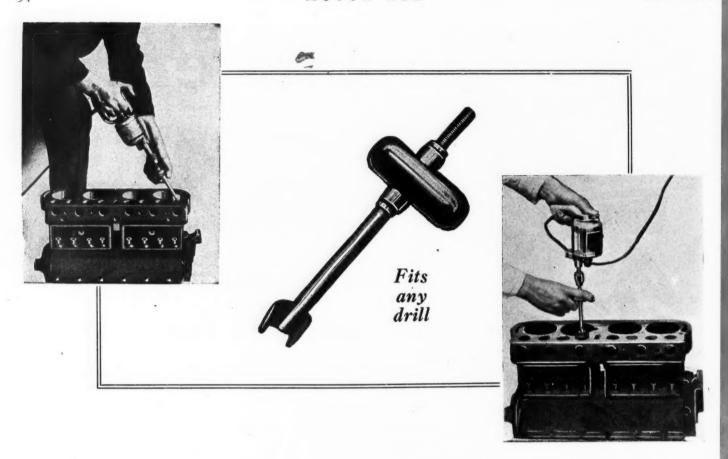
Every motorist who buys a Shaler 5-Minute Vulcanizer must come back to buy Patch-&-Heat Units for use in his Vulcanizer. It is just like buying a safety razor—it is useless unless you have razor blades to use with it. Take advantage of the opportunity—when a motorist comes in to make a purchase—ask him about his supply of Patch-&-Heat Units and you will find that your profits will increase considerably.

Write for Free Window Display

Signs, cards, cutouts, posters, everything you need to make a fine display on your counter or in your window, are yours for the asking. Also circulars to mail out. Ask for them.

C. A. SHALER COMPANY 211 Fourth Street Waupun, Wis.





Get more money out of Valve Grinding Cuts Time at least 75%

and Produces Improved Valve Seats

ONE of the commonest jobs in any repairshop—valve-grinding. Here's the way to get out of it ALL THERE'S IN IT and at the same time do the kind of a job you are proud of.

The KESS High Speed Valve Grinder handles any set of valves in a quarter of the usual time—or less. Can be operated at drill chuck speed while ordinary grinders are puttering around at 400 to 600 r. p. m. Some difference. Your cash register will prove it, the very first month.

Weighs but half a pound. Absolutely no VIBRATION. Reaches the hardest-to-get-at valve on any motor. Those rear valves on the Ford—EASY. Fits any electric drill or can be operated by hand with a breast drill.

The price-just \$5.



This low price means there is no extensive non-productive investment tied up when tool is not in use because your drill can be used for other purposes.

KESS High Speed VALVE GRINDER

The Kess Manufacturing Co., 809 Harrison Bldg., Philadelphia



"Why Don't You Get an Aermore, Mister? It Always Works"

The Horn That Will Always Respond

It does not depend on batteries and electric connection — it operates by exhaust gas. If the motor is running the signal works.



is not only a reliable signal, but a safe signal. It does not frighten and confuse like harsh, disagreeable signals. It gets the right of way with a smile, yet can be heard for a mile or more. Hundreds of thousands in use. Easily attached; lasts a lifetime; supplied with Fulton Hand Control unless otherwise ordered. Satisfaction guaranteed

MADE IN FOUR SIZES

THE LANGE THE PARTY OF THE PART
No. 00 22 in. Aermore Outfit Complete, "Motor Bus Special"\$14.00
No. 0 17 in. Aermore Outfit Complete, for large autos, trucks 12.00
No. 1 15 in. Aermore Outfit Complete, for medium cars
Ford Special Aermore Outfit with Hand Control
Give outside diameter of exhaust sine Ask your Johher or write us

THE FULTON COMPANY

Dept. 15-F 75th and National Aves., Milwaukee, Wis.

The Fulton Shellerite Steering Wheel

The demand for this splendid wheel has really surprised us, and the added safety and comfort it gives to driving is a surprise to the car owner. Will Not Crack, Warp or Fade.

Fulton Shellerite Steering Wheels are made of hard rubber, will not crack or fade. Have beaded top corrugated with outside hand grip. Polished aluminum spider inserted in rim. They dress up a car. Standard equipment on a number of high-priced cars. Diameter of wheel 17 in. For Chevrolet, Star, Dodge, Maxwell, Overland Cars. \$6.00 For Ford Cars.

Ask your Jobber or Write Us.





It Is Part of Every Aermore Horn

Dealers

The demand of the day is for safe driving — Aermores are in demand everywhere. Free Demonstration Stand given with order for 10 or more Aermores.



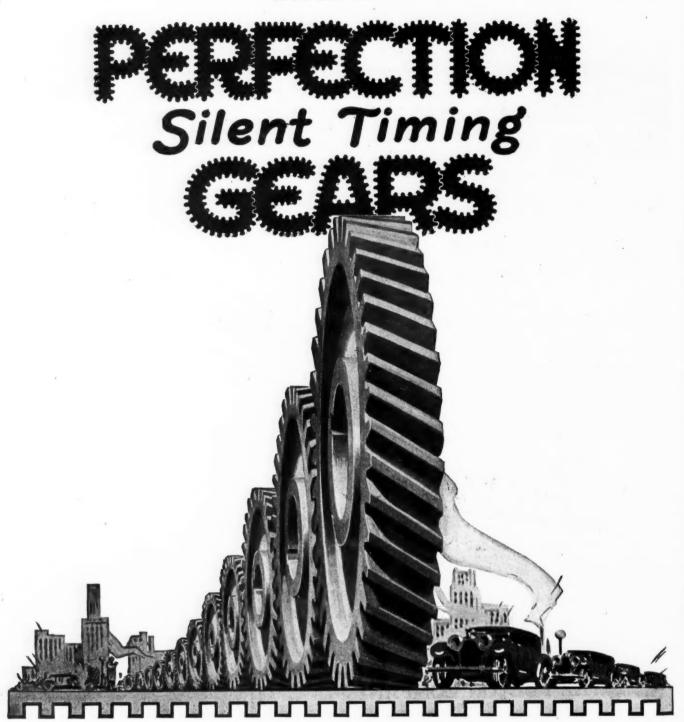
THE FULTON COMPANY

Dept. 15-F 75th and National Aves.

MILWAUKEE

WIS.

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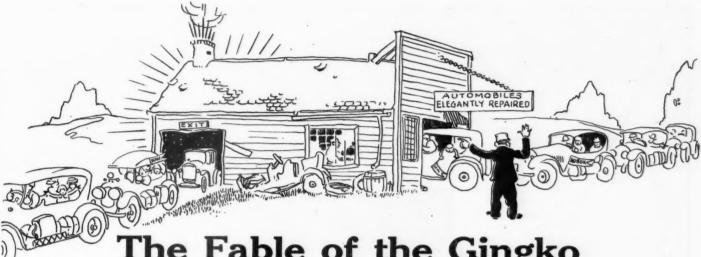


FAR stronger than anything we might say stands the record of what Perfection Silent Timing Gears have done. Built for 50,000 miles of silent durable service they have lived up to their guarantee in all kinds of cars operating under all kinds of conditions. Any car with a noisy motor—any motor up for overhauling will be improved with the installation of a set of Perfection Silent Timing Gears. Near you there is a Perfection jobber who carries a complete stock of Perfection Silent Timing Gears. Write us for his name and address and the Perfection Plan of developing profitable Timing Gear business for you.

PERFECTION GEAR COMPANY, 1475 Michigan Ave., CHICAGO

The world's largest silent timing gear specialists

The Worlds Standard Replacement Timing Gear



he Fable of the Gingko and the Autobummer or, Can a Gyp Gyp Himself?

With all sorts of apologies to George Ade

O NCE there was a Gingko whose Line was a darb with the Tourist trade. But the Home-folks had had Experience. So Business was rather Slow in winter. But in summer-

Fifteen miles out of town was a Circumference known as the Dead Line because that was as far as the Gingko's repairs lived. Almost any fine day in summer you could find a Tourist within fifty feet of this circumference, earnestly Praying. At least the Words were the kind preachers use, though with less Enthusiasm.



One day a honey-tongued Salesman offered the Gingko some new Piston Rings and took his order for them at the Reg-ular Discount. That proved him a Salesman. Usually the Gingko got an Extra ten ten and five per cent. So you know what kind of Stuff he was in the Habit of Buying.

Here we drop the curtain for two months

In the Second Act our hero is standing in the door of his Den



as a tourist bound the Other Way heaves in sight. From one or two previous Reprisals he had Learned. Sometimes they DID come Back, and if he happened to Remember

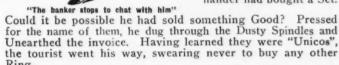
their Faces too Late, his own was likely to go for as long as two weeks, Unrecognized by his own children.

So he retreated to the Depths, picked up the Large monkeywrench kept for just such Emergencies and sent his helper to Greet the returned prodigal. Contrary to Expectations, to Greet the returned prodigal. Contrary to Expectations, it was a greeting, not a Lacing, that the traveler offered. The thunder-struck Gingko felt himself Basking in the unaccustomed glow of warm Appreciation.

Through the Haze he finally understood that he was being Thanked for putting in a set of Piston Rings. Krowing that his regular line of rings was made of mixed Putty and Carborundum, with a Trace of ground glass, he began to wonder who was craziest

-himself or the Past Customer.

A Glimmer of Understanding came when the date of the sale was mentioned. He remembered the lot of rings on which he had taken the regular This Gladdiscount. hander had bought a Set.



Moral: Some have success forced on them. Others go after it. This is your op-portunity.





If Your Dealer Can't Supply You, Order Direct From Factory

Do Not Buy Something "Just As Good"; Insist on Unico, and Have the Best

UNICO" MOTOR PRODUCTS CORP.

St. Louis Ave. and Kingshighway, St. Louis, Mo. ADVERTISEMENT

Apr



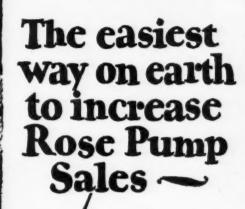


The fact that there are more GLOBE Traffic Signals, Tool and Battery Boxes made than any others must be a pretty good indication that motorists want them and that dealers sell them profitably.





The Globe Machine & Stamping Co. Cleveland, Ohio



Talk

Easy Pumping

Try it! Ask 'em to buy and talk Easy Pumping.

The Rose actually does cut the work of tire pumping in half. That fact interests the car owner more than anything else.

He knows some day he is going to get stranded with a flat tire, miles from "free air" and no spare. It happens to the best of them.

He wants an easy pump for the emergency. He is only human and hates to work. You can't blame him. So work on his human nature. Let him know you have what he wants.

Tell him about the patented valve that has made the Rose America's most popular tire pump.

Tell him that more than three million motorists use the Rose today.

Tell him about the 5year guarantee.

This plan will double your sales on a line that even now is one of the most profitable you carry.

FRANK ROSE MFG. CO., HASTINGS, NEB.

TIRE PUMP

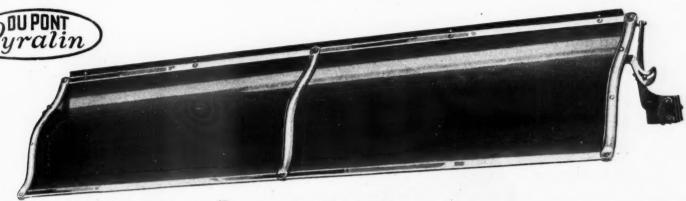




"There's something that would keep your eyes rested while you're rolling through the Yosemite this summer, Mr. Barclay. I can guarantee that, because I used one myself on that same trip last year. The afternoon sun is terrible while you're running west over the desert. That green Pyralin sort of absorbs the light—dulls it down. And it's lots better than goggles because it doesn't shut the air away from your face and make you sweat the way they do. I can put it on right now, if you like, and you can get the angle fixed to suit you before you start.

"Yes, siree, you won't find a visor anywhere made any better than this Premier. Why, at the New York Show two men worked in relays, hammering the panes with their fists while they told about it. They used only one visor all through the week, and it hadn't cracked by Saturday night. Just listen a minute—

PREMIER



"This Premier will last as long as your car. The chemical composition of genuine Du Pont Pyralin is such that evaporation of the ingredients which make it so elastic proceeds extremely slowly, and consequently the usual brittleness in material of this kind does not appear until it has given full service.

"Yes, they talk about water and heat of the sun softening these Pyroxylin compounds, making them sag and warp. But the Pyralin in the Premier is pre-formed and pre-shrunk, so that it must stand up. Why, say, every salesman has a standard offer for making comparison with other similar visors by offering to soak the two visors in a tub of water overnight. The Premier stands this test every time.

"Have you ever seen a visor blown inside out, like an umbrella, or with the frame all bent down? That was from wind pressure while the car was speeding. You'll never have that happen to your Premier. The maker stepped out to eighty miles an hour just to find out if the Premier would stand the gaff. It didn't. So he put in a brass middle rib, with a deep channel, and tried it again, against a head wind this time. The vizor stood up.

"Crack from cold? No chance. You see, Mr. Barclay, these panes aren't riveted into the frame. They're full-floating. A notch is cut in the edge for the rivet, and an eighth of an inch left all round for expansion. The panes are independent. So they can crawl all they please when they get hot or cold, and never bulge or split. Besides, the panes are two-fifths thicker than usual, being especially made, so they are lots stronger.

"The triple-curve is about the best part of the whole thing. It makes the panes self-supporting, almost. The maker experimented with flat and double-curved panes, but they wouldn't stand up long. He couldn't run more braces across. So he put in the triple-curve. Now the panes are self-stiffened, just like corrugated iron. They can't hang down like a hammock with Judge Taft sitting in it.

"Thanks for the seven-fifty, Mr. Barclay. Sure you've got everything you need? Have a good time. Good-bye." Aside: "Golly, that's the fourth Premier today. Better get a standing order in for two dozen a week if they keep on this way. I'll write that jobber right now."

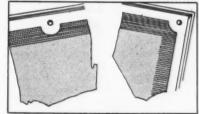
Grigsby-Grunow-Hinds Co.
906 W. Lake St. Chicago, Ill.

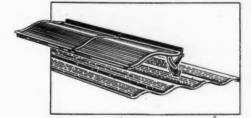


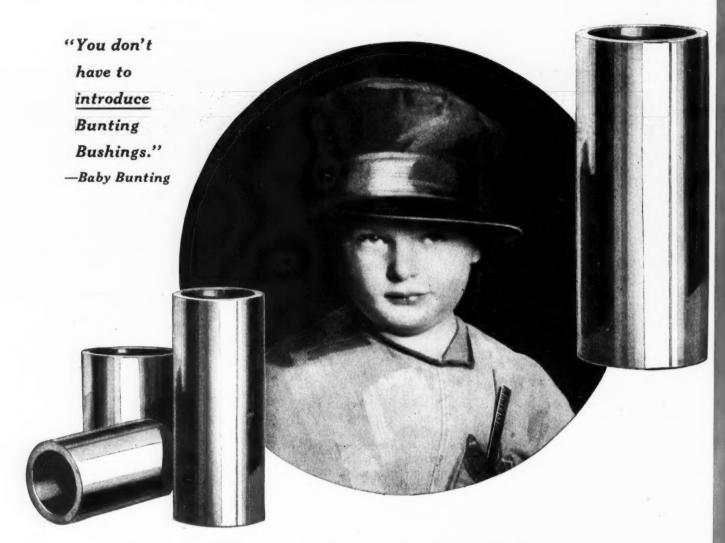












Bunting Bushings Add Satisfaction to Service



The Nationally Advertised Line

Automotive Jobbers — Write for Bunting's Piston Pin Bushing list No. 18 and Spring Bushing list No. 111.

PEOPLE associate Bunting Bushings with skill and efficiency.

When you bush pistons and springs with genuine Bunting Bushings, your customer knows that you appreciate and deliver good and satisfactory service.

tory service.

The prestige, popularity and recognized high quality of Bunting Bushings add to the value of the service rendered whenever they are applied.

The leading jobbers everywhere have ample stocks for all automotive

THE BUNTING BRASS & BRONZE CO. Toledo, Ohio



New York
Chicago Cleveland
West 54th St. 722 S. Michigan Ave. 710 St. Clair St., N.E.
Circle 0844 Wabash 9153 Main 5991

San Francisco 198 Second St. Douglas 6245 Boston 36 Oliver St. Main 8488



BUNTING





Price



\$6.00

SAFETY FUSE

WE ARE PLEASED TO ANNOUNCE THAT THE

Siesto CIGAR LIGHTER

Has Been Made

STANDARD EQUIPMENT ON

CADILLAC

MOTOR CARS

The Presto Automatic Rewinding Dash Cigar Lighter can be easily installed on any car. Current automatically turns on when you pull out the lighter. Cord winder pulls lighter back into socket, and automatically turns off current.

CONVENIENT

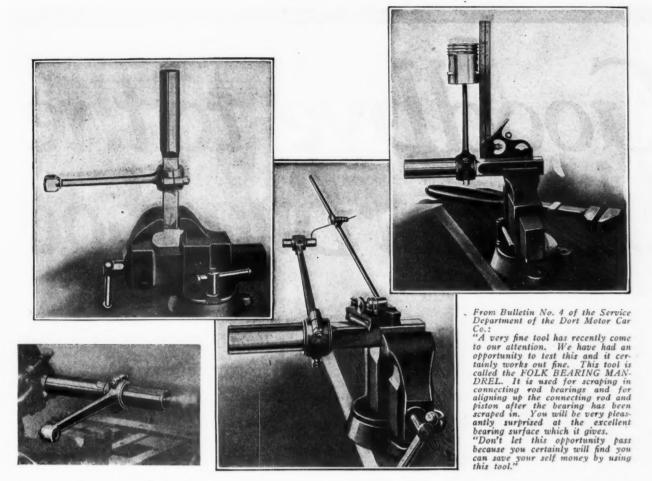
PRACTICAL

HANDY

Write for illustrated folder 22 describing this and 100 other quick-selling Presto products—Visors, Stop Signals, Dash Lamps, Electric Heaters, etc.



METAL SPECIALTIES MFG.



100% Bearing in 10 Minutes

Not Under the Car—AT THE BENCH

This simple garage tool cuts the time required to scrape and fit connecting-rod bearings to TEN MINUTES. Saves hours of working under the car-you do the job in the vise at your work-bench-or in your lathe.

This WAYNE Folk Bearing Scraping Mandrel also squares pistons and wrist pins with the crankshaft. Cocked pistons, even though brand new, are sure to pass oil. The WAYNE Mandrel absolutely prevents cocked pistons.

Squared at one end, round at the other. High grade tool steel, hardened and ground. Made by master tool-makers.

Eight sizes cover most popular makes of crankshafts. Prices range from \$7.05 up. Ford size, \$7.05. Can be furnished for all cars. A time-saving wonder. Hundreds in daily use.

Let us mail you descriptive circular and complete price

Ford Size



FOLK BEARING MANDREL

WAYNE TOOL MFG. CO., Waynesboro, Penna.

MEANAGE OF A STATE OF THE SECOND OF THE SECO

Goodbye-to the Used Car Bugaboo!



S AN AUTOMOBILE dealer it is useless to recall to your attention the numerous financial difficulties and selling problems that have been loaded on your shoulders by the used car situation.

Individual dealers and dealer organizations in every town in the country at one time or another have taken up the subject and, in desperation, tried every means at their disposal to solve the problem.

But for the big majority of the motor car dealers, the problem remains unsolved. These dealers still have to make two sales before they can realize the profit on one. —The new car is sold and then the trade-in car must be sold. Salesmen must devote the better part of their time to the selling of used cars instead of devoting their entire time to the selling of the new cars.

The Cole Merchandising Plan has solved this problem for every Cole dealer and distributor and its economical soundness will solve the *used car problem* for you.





How the Cole Merchandising Plan Operates to the Advantage of the Motor Car Dealer

Under the Cole Plan no used cars are taken in trade. By eliminating this costly practice (more than 50 per cent of the operating overhead) it is possible for Cole to establish a much lower *Net Price* instead of the usual inflated *List Price*.

The market for the Cole Aero-Eight at *Net Price* is increased from 200 to 300 per cent or more. There are two or three times as many potential buyers at \$1885 as there were for this same car at \$2685.

By eliminating the Used Car Department, it is possible for you to reduce your overhead operating expenses from 40 to 80 per cent. You do not have to wait for weeks or maybe months before you know about the profit you have made on the new car sale—you don't have to wait until the used car, whose value depreciates daily, has been sold.

Another factor that you should consider pertaining to the finances of your business—under the Cole Merchandising Plan your merchandise is all new. It means that it is 100 per cent asset and not a part liability. Your banker is far more apt to loan money on new merchandise at prevailing rates of interest. Financing plans of various kinds at exorbitant rates do not have to be worked out.

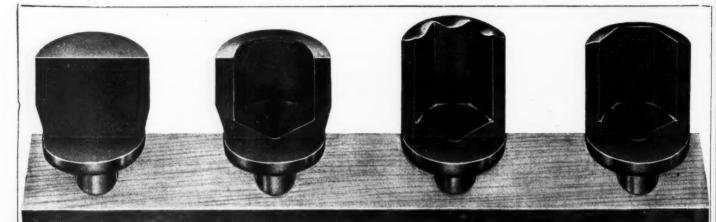
The following table shows by comparison just how the "List Price" and "Net Price" are figured out in terms of dollars

Prices under List Price Pla	n	Prices under Net Price Plan
\$2685	Touring Seven Passenger	\$1885
2685	Phaeton Four Passenger	1885
2685	Roadster Two Passenger	1885
3285	Coupe Four Passenger	2585
3685	Sedan Seven Passenger	2685
3685	Suburban Four-Five Passenger	2885
3885	Berline-Limousine	2885

Additional Cole distributors are being appointed. A wire or letter from you will bring the details as to the situation in your territory

COLE MOTOR CAR COMPANY

INDIANAPOLIS, INDIANA, U.S.A.



ALLEN PROCESS MAKING A SOCKET

Mechanics know that the sockets make or break a wrench

set. Usually they break 'em-unless the sockets are cold-drawn, as above. There you see the successive stages in the cold-drawing process. First, the solid "blank" of special analysis steel. Then the drilled-out socket, with the extra thickness of stock in the socket-wall. Next, the socket colddrawn to the finished size; driven through a die by a solid hexagon punch; tremendously compressed and given 30% increased strength. Finally the finished article—finely machined and scientifically heat-treated. The result is a socket unbreakable in use and so guaranteed by the Allen Company, the sole producer of cold-drawn (Allen process) sockets.

BAY STATE WRENCH SETS





BAY STATE (Allen) Wrench Sets come in combination covering every requirement of mechanics, car owners, millwrights and all who have need of unbreakable tools, so guaranteed. Box Sets and Bag Sets-two of the most popular illustrated above. The Bay State booklet, picturing and pricing the complete line, is a mighty handy little wrench reference-book—sent if you'll ask.

135 Sheldon Street COMPANY . . . HARTFORD, CONN. IHE

Manufacturers of Safety Set Screws, Socket Head Cap Screws, Pipe Plugs, Tap Extensions and Socket Wrenches - Allen Process Pacific Coast Branch Office: The Charles A. Dowd Sales Co., 320 Market Street, San Francisco, Cal.

The Johnson Sales Co. 1429 Candler Bldg. Atlanta, Ga.

J. V. McDowell, Chas. A. Dowd Sales Co. Johnson Chicago, Ill. San Francisco, Cal. Kansa.

Johnson Sales Co., The Rathbun Co., Western Auto Supply Co., 3108 Brooklyn Ave., Kansas City, Mo.

Rathbun Co., Western Auto Supply Co., Los Angeles, Cal. (61 Stores)

"Child—or Stepchild?" an analogy

Maximum pressure-tank storage capacity-motor characteristics -automatic starting duty-frequency of operation-these are but a few of the problems peculiar to air compressors for free air service in garages and filling stations. It is to the purchaser's own greatest interest and protection to see that his CURTIS compressor outfit is a genuine CURTIS factory built product, factory guaranteed, supplied and sponsored by a designing, engineering and manufacturing institution with a career of 69 successful years.

When you purchase a CURTIS garage compressor outfit, built complete by the CURTIS organization in the CURTIS plant, your protection lies in the following facts-

> 1-The proper relation and suitability of component parts. No misfit motors, switches and the like. Speeds, loads and capacities are right, starting loads are eliminated and there is a consequent freedom from trouble and expense which the chances favor in an amateur assembled outfit-a "step-child" at best.

> 2-A complete unit tested as a unit under its own power in addition to the usual separate test of component parts; a final check-up under your actual running conditions duplicated in our shop.

> 3-The CURTIS guarantee covers the entire unit as a whole and the CURTIS organization stands back of it as a unit; no divided responsibility, no shifting of the blame for possible trouble later on,-"no passing of the buck."

We manufacture a complete line of both single and two-stage air compressors. A style, size and arrangement to meet your particular need. Write at once for full details and prices.

CURTIS PNEUMATIC MACHINERY CO.

1527 Kienlen Ave.

St. Louis, Mo., U. S. A.

Branch Office: 530 H, Hudson Terminal Canadian Representative: Joseph St. Mars, Winnipeg and Toronto, Canada.

"An Original Design"





Style "X" Single-Stage Outfit Portable, Belt-ed or Geared. Five sizes. A.C. or D.C.





A two-stage compressor is only as good as its intercooler.

- (a) COPPER Intercoolers with thin radiating fins ridigly attached are original with CUR-TIS two-stage compressors. One hundred and thirty-five per cent better heat-conducting properties than cast iron, 112 per cent better than steel and 27 per cent better than
- (b) CURTIS Intercoolers are approximately 50 per cent longer and have about 100 per cent more heat-radiating fins than competing de-
- (c) CURTIS Intercoolers are exposed their entire length to the cool blast of the fan

All the features of the CURTIS Single-Stage, plus real two-stage efficiency.



Style "Z" Single-Stage Belted only. 1/4 H.P., A.C. or motor. Five sizes.

Coupon Curtis Pneumatic Machinery Co.

Single and Centlemen:
Please send me full details on Curtis Air Compressors, your proposition and prices.

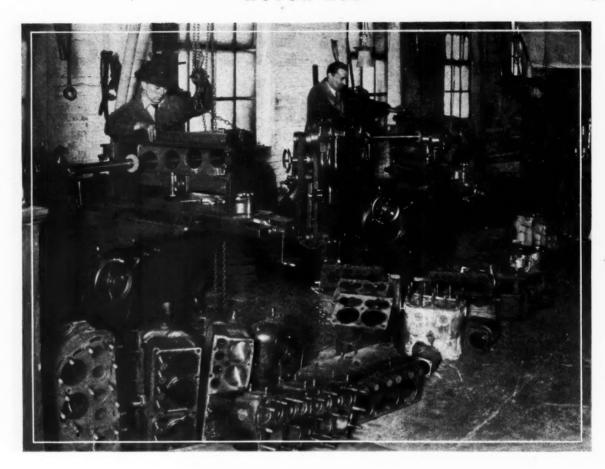
Name.

Address.

Address.

Address.

Address.





E-E-INTENCE & CO. MAIN OFFICES.
WORLWORTH BUILDING, NEW YORK.

Searry, N. J., April 30th, 1902.

endis Tool Company, **ymestore, Pennsylvania.

Regarding the No. 5, Landin Cylinder Grinders, which we have had at our plant for the past six months.

which we have now at our pirmt for the post six months.

We wish to navise that the senk that we have
turned out with these mothines, has been the been
forfectly and exercisly. In fact, the works has been
done to the best been constituted that class
and desire to contain the perfect operation of
these enthines.

"e think this is due you in view of the from of the success that we have had, both on quality and the quantity of the cylinger that we have been able to grand. Seing well pleased sit the machines, so are silling to recommend these to expose."

These suchines take up less floor space than some teachines and are perfect in operation.

Trusting we will be in a position to place snother grinder in a short time, we beg to resain

You, truly yours, L. Leakence & COMPANY

LL:HB

Per 99 President

1923

An Installation of Cylinder Grinders we're proud of

Lawrence Company enthusiastic over their latest Landis Machines. Report that they have been commended on the class of work they are turning out. "Willing to recommend them to anyone. Perfect in operation."

THE L. Lawrence Co. is a busy cylinder grinding organization. The picture on the left hand page shows two Landis Cylinder Grinding Machines in their Newark (N. J.) branch.

Read their letter. Remember, these people are large reconditioners of cylinder blocs. Naturally, they have had experience with other makes of cylinder grinding machines. That they prefer Landis should, we believe, have great weight with others about to make a selection of similar equipment.

Landis—one of the largest builders of grinding machines—gives you everything necessary or desirable in a cylinder grinding machine.

QUICK CHANGE FROM ONE JOB TO AN-OTHER. The Landis Centering Bar and the Landis Centering Fixture make changing from one bloc to another a matter of a few minutes.

TIME - TRIED CONSTRUCTION. Every Landis detail of construction is the result of our long experience—the machines come to you PERFECTED, ready to make good under any reasonable operation condition.

We suggest, first, the Landis catalog — then a Landis quotation. No obligation of course.

Consider these points

Maximum diameter machine will grind Maximum diameter hole machine will grind—regular equipment53/8 Minimum diameter hole machine will grind-regular equipment21/2 Maximum depth machine will grind with regular spindle15" Off center movement of wheel spindle.....1 1/16" Feed of wheel spindle. per revolution of outer eccentric sleeve .0005 to .0015

Rotary speed of outer eccentric sleeve R. P. M. 40 and 82

Speed of grinding wheel spindle R. P. M. 5415 and 7075

Maximum traverse of work carriage31½

LANDIS TOOL CO., WAYNESBORO, PENN.

New York Office: 51 Chambers Street

GATES HOSE

"The Standardized Radiator Hose"



Just notice how much tougher the rubber lining is in Gates Vulco Hose—remembering that radiator hose gets all its wear inside. That's why 80,000 dealers recommend Gates Vulco.

Made by the World's Largest Manufacturers of Fan Belts. We are tripling sales this year!

You can share in the profits with this cabinet on your counter—





—and this sign over your door

ALEMITE

High pressure

Lubricating system

The Alemite Proposition to Dealers

So far this year, our total sales are three times as large as our volume for any similar period of time in 1922. If our sales are tripling, that means Alemite dealers' sales are tripling too. What they can do you can do.

With the powerful Alemite advertising campaign to back you; with the ever-increasing demand for Alemite products; with the exceptionally efficient merchandising and distributing service offered by this organization, your success with the Alemite line can be as big as you want to make it.

How we help you sell

(1) We give you the best product

When you become an Alemite Dealer you identify your place of business with the highest grade products money can buy. The Alemite High Pressure Lubricating System is dominant in its field. It is recognized by engineers everywhere as the most efficient method of chassis lubrication. 3,000,000 cars are already Alemite-equipped. Every motorist wants this system on his car.

Alemite Lubricant is the best lubricant on the market. It is pure, solidified oil—all lubricant—with enough body to stay with the bearings. Furthermore it is packed in autoloading containers, for convenience in filling the Alemite Compressor.

This feature alone makes a big appeal to the 3,000,000 owners of Alemite-equipped cars. The Alemite Lubricating Spring Cover is the only flexible, all-metal spring cover on the market. It protects the springs from dirt and water, eliminates squeaks and rattles, makes any car ride much easier.

(2) The Alemite Counter Cabinet

The handsome Alemite Display Cabinet is the cornerstone of the Alemite Sales Plan.

This cabinet holds down your stock investment to a small sum, yet enables you to supply instantly a complete Alemite System for any make or model car. Our Equipment Manual, which goes with every Cabinet, specifies the kind and number of fittings needed for any installation.



Strong as our advertising campaign has been in the past—and much as it has already accomplished—it's nothing to what we are doing this year. Every month more than 7,000,000 Alemite sales messages will be broadcast to the car owners of this country through The Saturday Evening Post, The American

Magazine, The Country Gentleman, Motor and other national advertising.

That means hundreds of motorists, right in your own neighborhood, will want Alemite Products. That means triple profits for you if you prepare to supply the demand now.

ALEMITE

High pressure lubricating system

In addition to the money you make from the sale of new systems, this Cabinet puts you in position to share in the steady replacement business coming from the 3,000,000 cars already equipped with Alemite.

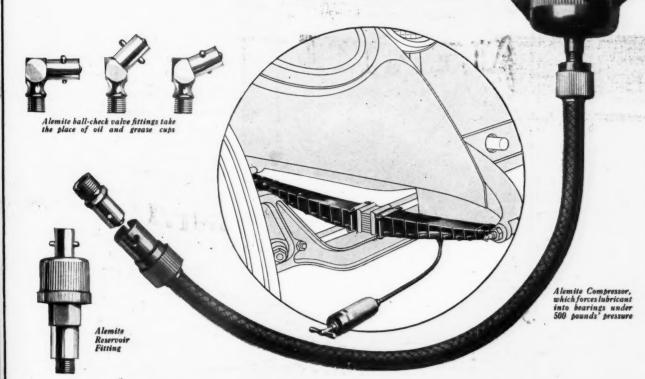
(3) Alemite Signs and Literature

In addition to the beautiful Alemite Cabinet we furnish you with handsome three-color outdoor signs, we supply eyearresting window displays, we provide folders, envelope stuffers and other sales helps—all of which link up your place of business with Alemite advertising and Alemite reputation.

That is the line-up for 1923—a big national advertising campaign behind the leading product in its field—an attractive counter cabinet, outdoor signs, window displays, sales literature.

It's going to be the biggest year in our history. And there's real money in the line for you.

Alemite Lubricating Spring Covers exclude dust and grit, keep springs properly lubricated and repay their cost in smoother riding, lengthened car life and lessened tire expense



ALEMITE

High pressure lubricating system

This calls for quick action

The biggest selling season for Alemite products will be the next few months. Now is the time to get in on the ground floor with the fastest-growing organization of its kind in America; to share in the profits Alemite dealers everywhere are reaping on the tremendous demand we have already built up for Alemite products.

Mail the coupon today for complete details on the Alemite money-making proposition.

THE BASSICK MANUFACTURING CO. 2662 North Crawford Avenue, Chicago, Ill.



This is the Alemite
"H-15" portable
Compressor. Just the
thing for garages, luthing for garages, lu-bricating stations, factories and places where there is consid-erable lubricating work to be done. Holds 15 pounds of fubricant, provides a pressure up to 2,000 pounds, eas-ily carried about from place to place.



Alexander of the ALEMITE High Pressure Lubricating Syst ALIMITE PRODUCTS COMPANY of CANADA, LTD.

The Bassick Mfg. Co. 2662 N. Crawford Ave. Chicago, Ill.

I'm interested in the Alemite Dealer Proposition.

Please send full particulars. I sell _____automobiles
I sell accessories I sell...

☐ I operate a garage
☐ I operate a filling station

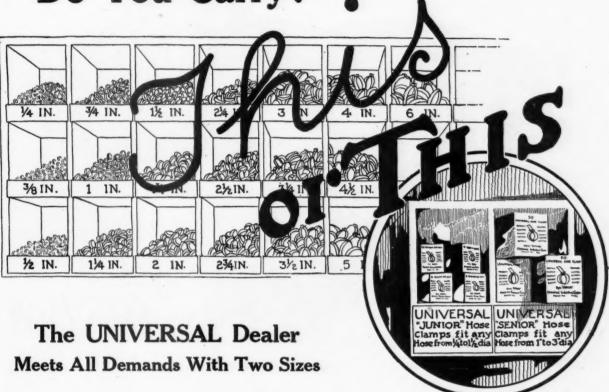
3,000,000 motorists using Alemite-equipped cars are special prospects for Alemite Lubricant. It is pure solidified oil and won't cake or gum. The fact that it comes in patented containers which load the Alemite Compressor quickly and cleanly assures you a quick turnover. Packed in 5-lb., 1-lb., and ½-lb. cans for retail sale. Also sold in 100-lb., 200-lb., and 400-lb. steel drums.

High pressure lubricating system

Name.

Alemite Gasoline

Which Size Stock Do You Carry?



UNIVERSAL has simplified the hose clamp business by producing an adjustable clamp, two sizes of which will clamp any hose of any diameter.

The Junior size fits all hose from $\frac{1}{4}$ to $\frac{1}{2}$ inches; the Senior size all hose from 1 to 3 inches; and both in series will clamp any hose up to 6 feet or even more if necessary.

The UNIVERSAL hose clamp is made of cold rolled steel from wire—not strap.

Its edges are therefore smooth—it will not cut or otherwise injure the hose. Holes are ½ inch apart and clamp is scored between for easy break-off. Electro-galvanized, with pressure increasing bead at the clamping point.

Put your hose clamp business on a more profitable basis. Sell UNIVERSALS and do the same business with one-tenth the stock—and incidentally save valuable shelf space.

UNIVERSAL INDUSTRIAL CORP. - Hackensack, N. J.

Sole Manufacturers

DEPARTMENT OF SALES

F. C. West Corp. 616 S. Michigan Ave.

PHILADELPHIA T. Scott Eavenson 1533 Cherry St. BOSTON Burton Rogers Co 755 Boylston St. DALLAS Harry Knight 2218 Commerce St. LOS ANGELES Roland S. Boreham 600 Metropolitan Bldg. Patents Granted March 20, 1917 March 1, 1921

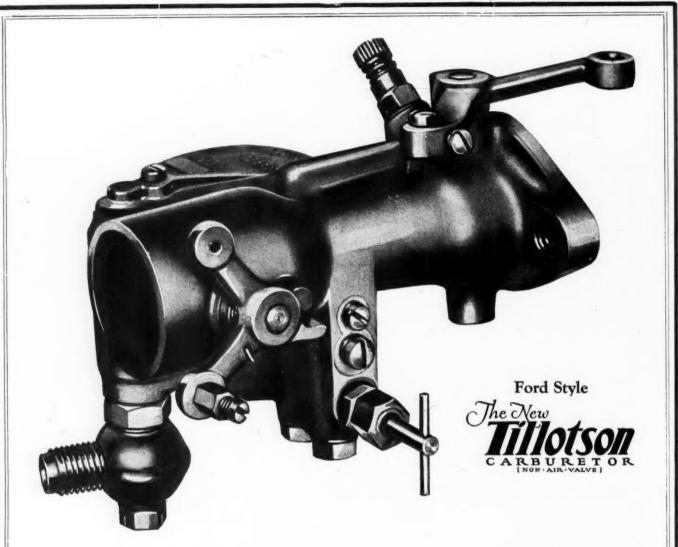
LOOK FOR THIS TRADE MARK



UNIVERSAL HOSE

Adjustable to fit any hose of any size





Perfecting An Organization To Sell Economy!

When the new Tillotson non-air-valve carburetor was perfected, a remarkable opportunity was created for dealers.

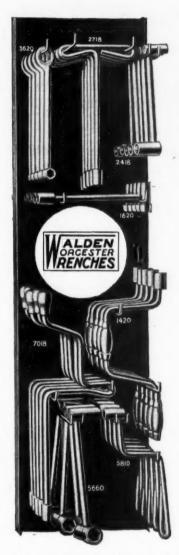
This wonderful new Tillotson product will save gasoline for any car owner whose car now is equipped with an older type carburetor. The difference in performance is so great it is easily noticeable. The first nonair-valve you sell will sell the next hundred for you. This is the first big opportunity dealers have had to build a carburetor replacement business. Carburetor replacement adds no overhead. It gives your shop a new source of income. Carburetors and parts show you a long profit. Discounts are liberal!

People will be hunting the Tillotson Service Station Sign this year. We are appointing distributors and service stations now. Write us to-day!

Tillotson Manufacturing Co.

Toledo

Walden-Worcester Display Boards Make Selling Easier



No. 40 Board. Five each of the eight most popular socket wrenches for Ford cars. Equally efficient on other popular cars.

Our display boards have always proven good salesmen—the two NEW silent salesmen which we are showing will help increase your sales.

They take up little space $(3'9'' \times 1')$ and will hang on the wall or post.

The investment is small—the turnover great.

A big producer for the large or small dealer—equally profitable for the tire service station.





No. 20 Board. An entirely new design in Rim Wrenches. Five each of four standard sizes.

There are particular Walden-Worcester Socket Wrenches for particular parts of each particular car.



WALDEN-WORCESTER

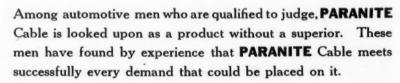
INCORPORATED
WORCESTER, MASSACHUSETTS



PARANITE CABLE IF IT'S PARANITE IT'S RIGHT

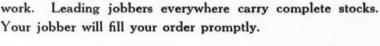
The Standard for 33 Years

PARANITE Cable has won for itself a place of leadership in the automotive industry. More than a quarter century of specialization has resulted in a line of cables that is not only complete but known all over the world for quality and absolute dependability of service.



Into the manufacture of PARANITE Cable go the very finest rubber compound, cotton and flexible enamel varnish. The methods and equipment used at the factory have been developed through years of specialized experience.

There is a PARANITE Cable for every kind of automotive work. Leading jobbers everywhere carry complete stocks. Your jobber will fill your order promptly.



THE INDIANA RUBBER & INSULATED WIRE CO.

Factory and General Offices: Jonesboro, Ind.

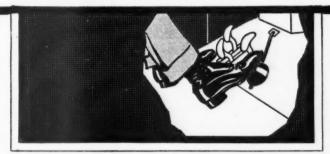
210 S. Desplaines St., Chicago







Control Your Ford With Compressed Air



A New method of Control

- developed by the Motor Products Corporation gives the Ford the flexible, smooth acceleration of high power

Air is flexible—elastic. This elastic quality has been so applied in the new M. P. C. Pneumatic Accelerator that it gives a velvety flow of power to Fords never before attained.

The M. P. C. Pneumatic Accelerator prevents choking or bucking on quick get-away. The flexible air-valve control is adjusted to feed the motor every drop of gas it can consume—but no more.

The result is a swift, smooth "get-away" without a suggestion of hesitation. It puts the Ford at the front of the traffic stream every time.

The M. P. C. Pneumatic relieves the strain on both driver and motor. It eliminates use of the hand throttle and prevents the "jerky" feeding of gas usual with foot accelerators. The air valve is really an *air cushion* for the motor.

Dealers-

This remarkable new product opens a tremendous market for you. Quick turnover is certain. Sold over the counter with little or no effort,—no installation expense or bother. It is made and guaranteed by the Motor Products Corporation. Practical dealer helps will be furnished to assist you in building a very profitable business in the M. P. C. Pneumatic. Write for our liberal proposition.

MOTOR PRODUCTS CORPORATION
11805 Mack Avenue DETROIT, MICHIGAN

Pneumatic ACCELERATOR





What is a new customer worth to you? Certainly more than the profit on his first purchase. His value is represented by the profit on all the articles you may reasonably expect to sell to him. You bring in new customers by selling arti-

cles he cannot buy at every store. The Cole Visible Gasoline Gauge is such a trade builder. Ford owners will go out of their way to get it, because they know it is a motoring necessity and there is nothing "just as good."

Sell this Visible Gasoline Gauge to Every Ford Owner

A big car refinement at a small car price. Made by the company that furnishes special model visible gasoline gauges as standard equipment on sixteen well known cars.

Installed on the instrument board in less than an hour. Always visible from the driver's seat. Prevents worry about the gasoline supply - furnishes a sure check-up against the accuracy of filling station pumps.

Model A is made in four styles: for touring car or roadster, for 2-door sedan, for coupe, for 4-door sedan.

DEALERS-More Fords will be on the road this year than ever before. Every Ford owner a prospect for this gauge. Write now for descriptive literature and trade terms.

THE STEMCO ENGINEERING COMPANY Light Car Division

205-215 Webb Street

Dayton, Ohio

"Read as You Ride"

COLE VISIBLE GASOLINE GAUGE

Made Especially for Ford Cars

The Cole Visible Gasoline Gauge Tells:

- How much gasoline is in the tank. The red indicator is always visible.
- 2 Howmuch gasoline to order at the filling station.
- How much gasoline the Ford owner gets when he buys.
- How many miles to the gallon.





Cole Visible

The Stemco Engineering Company 205-215 Webb St. Dayton, Ohio

Send me your circular describing the Cole Visible Gasoline Gauge and tell me about your liberal dealer offer.

Address

The International Motor Truck Contract Offers You Many Such Opportunities

ECENTLY an International Motor Truck representative found business among his regular customers temporarily slow. He immediately made an analysis of his market and began to work on prospects hitherto unthought of. As a result, he was instrumental in forming a community delivery and transfer system which added 7 International Motor Trucks to his sales record. He found the hidden market and developed it.

Whether you are located in an industrial and mercantile center, a medium-sized town, or a small village, there are before you undeveloped possibilities for the sale of International passenger busses, funeral cars, ambulances, police patrols, motor fire apparatus, transfer and storage trucks, oil trucks, street flushers, telephone and telegraph maintenance outfits, milk trucks, bottlers' trucks, and a hundred and one other regular and special trucks for industrial, municipal, and general haulage.

Study your market, then write and ask us about the five concrete facts in the *International Motor Truck Contract*. They will help you build a permanently successful motor truck business in any section where there is hauling to do.



Sizes:

2,000-1Ь.	Spe	eed Ti	ruck
Model 2	21,	2,000	lb.
Model 3	31,	3,000	Olb.
	41,	4,000	0 lb.
Model 5	52,	5,000	0 lb.
Model (51,	6,000	Olb.
Model 10	01.	10,000) lb.

INTERNATIONAL HARVESTER COMPANY

OF AMERICA

606 SO. MICHIGAN AVE.

(INCORPORATED)

CHICAGO, ILL.

INTERNATIONAL SERVICE REACHES EVERYWHERE

for Economical Transportation



Automobiles and the Law of Averages

Nobody knows how long any man may live, but insurance companies know what fraction of every thousand men will live out a twenty-year policy.

Nobody knows which people in any community will buy an automobile within twelve months, but the records of the automobile business clearly show how many automobiles CAN BE SOLD per thousand families in any given territory.

The law of averages proves one very important point: i. e. about 80% of all cars in use sold for less than \$1,000. This means that in your locality, during the next

twelve months, 80% of the automobiles bought will be low-priced cars.

In this great market a new average has made its appearance: i. e. the rapidly growing average per thousand of low-priced cars sold that are bought on a QUALITY basis—which means Chevrolet, the world's lowest priced quality automobile.

Quality, today, in automobiles, means not merely fine appearance and riding comfort: more than ever before it has come to mean engineering efficiency resulting in economical transportation.

It pays to study these averages and get in line.

Chevrolet Motor Company

Division of General Motors Corporation

Detroit, Michigan

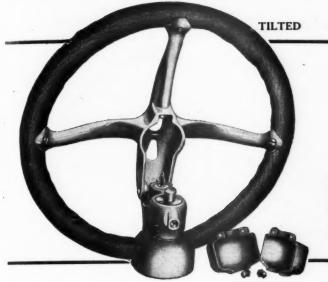


4-Passenger Sedanette \$850 f. o. b. Flint, Michigan

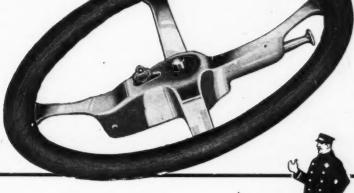
Dealers and service stations everywhere. Applications will be considered from high grade dealers only, for territory not adequately covered.

All Prices f. o. b. Flint, Mich.

in the state of th		
SUPERIOR Two Passenger Roadster		\$510
SUPERIOR Five Passenger Touring		525
SUPERIOR Two Passenger Utility Coup	e .	680
SUPERIOR Four Passenger Sedanette		850
SUPERIOR Five Passenger Sedan		860
SUPERIOR Light Delivery		510
SUPERIOR Commercial Chassis .		425
Utility Express Truck Chassis		575



CLOSED



Sell Protection With the Wheel

CHEVROLET DRIVE SHAFT

The Chevrolet Drive Shaft shown below is only one of the complete line of Spencer Axle and Drive Shafts.

All are guaranteed to be 100% replacement of the original part. Only MOLYBDENUM Steel and mechanical excellence can make this quarantee possible.

From our descriptive data get the interesting details.

Above all, the new owner doesn't want his car stolen. He realizes his need for protection against theft—and is willing to pay for it.

Naturally he turns to you for recommendation.

This is your chance to render him a great service—and at the same time tuck away a tidy profit.

Show him the Spencer Lock Tilting Steering Wheel—it will please him. For it combines absolute security with greatly increased car comfort.

The working parts are enclosed in a hardened steel forging which withstands all assaults with hammers, cold chisels and hack saw.

In the driving position, the wheel is rigidly and positively locked to the steering post. In the locked position the wheel spins idly on ball bearings. The only operation necessary for locking or unlocking the wheel is turning the key in the lock. The lock, protected by an armored steel plate, is on top in plain sight, and can be operated with the wheel either down or tilted.

The wheel is quickly installed and is transferable at will by the owner. A horn button is located in the center of the wheel—giving the driver an added convenience.

Made for Ford, Dodge, Chevrolet 490 and Superior, Overland, Maxwell, Star and Gray Cars. Approved by the Underwriters' Laboratories as a most reliable theft preventative. It soon pays for itself in greatly reduced insurance rates.

Spencer Wheels are distributed only through legitimate jobbers. If a stock hasn't reached your jobber yet, write direct. Our prices will interest you. So will the discounts.

The Spencer Mfg. Co. SPENCER, OHIO





OPEN ROADS ARE CALLING—

answer with this better fan belt

GILMER has perfected a new fan belt. Super-Service is its name—and it lives up to it.

This better belt has a metallic finish that makes it impervious to heat, oil and water.—It's the Dempsey of Fan Belts.—It makes lots of friends for the man who sells it.

The new Gilmer belt comes wrapped in pairs. One goes on the motor, the other goes in the toolbox. This new package puts the "Carry a Spare" idea over big and helps you sell twice as many belts.

L. H. GILMER CO., Philadelphia

No Man Wants a Rattle

Show the new individual cartons of Gilmer Radiator Lacing to your customers—enough in each package for radiator or cowl. Tell them how sixty per cent of all rattles and squeaks come from the hood. Then watch the sales climb.

"It's a Gilmer product

you can depend on it"

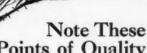
Happy Van





Announcing— "A Giant in its Class"

This announcement means more all 'round motor efficiency for every Ford car, truck or tractor. It is the most important announcement regarding Ford ignition since the introduction of the famous TURNER 2 in I TIMER.



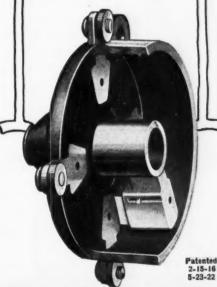
TIMER SHELL of one - piece, short-proof bakelite. Strong, rigid, neat. CONTACTS of heavy, hard, yellow brass with upper integral part extending through case forming wire connections outside.

AIR POCKETS in center of each contact prevent heating of brush and inserts.

TERMINAL POSTS hold terminals in position that makes short circuit impossible.

DRAIN SLOT drains any water or oil that may get into timer. BRUSH ASSEMBLY consisting of heavy, hard rotor casting holding specially treated phosphor bronze brush which wipes clean as it rotates.

PRICE \$2.50



Points of Quality

Motors

For All Ford

THE TURNER JUNIOR TIMER, a genuine quality product throughout, is built upon the same practical principle which has already established the TURNER 2 in 1 TIMER as the leader in

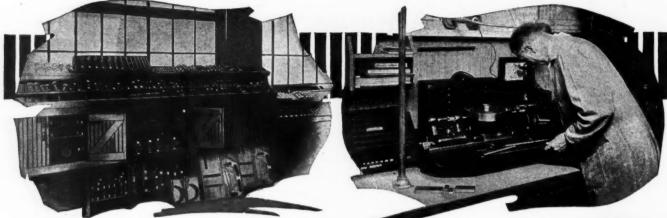
The same painstaking care in construction, the same high standard of material selection, characterize this newest development in the TURNER Line.

THE TURNER JUNIOR TIMER will positively do these things for any Ford: Increase power, greatly lessen plug fouling and in many cases stop it entirely; start the motor instantly in all weather; save gasoline; decrease motor "kicking." It is quickly and easily installed and requires NO OILING.

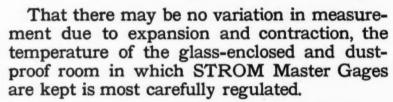
Write today for further information concerning the famous TURNER TIMERS—the "2 IN 1" with the complete wiring assembly and aluminum alloy shell—the "JUNIOR" with the Bakelite shell. Address Department K.

TURNER MANUFACTURING CO., Kokomo, Ind., U. S. A.

Manufacturers of the Turner Line of Quality Automotive Devices.



Temperature & Master Gages



At regular, frequent intervals the shop gages are brought to this test room and compared with the Master Gages and with a standard comparator checked to .00001 of an inch. No variation from laboratory standards is permitted in the STROM output.

Maintaining accuracy of measurement means maintaining minimum of friction. STROM Ball Bearings as nearly approach perfection in measurement as untiring human watchfulness and constant machine precision can make them. Power flows through them with almost no resistance.

STROM guaranteed ball bearings deliver the maximum of power from motor to wheels

"Wherever a Shaft Turns"













G & K complete line of Fan Belting and Clutch Leathers. Well displayed, easy to handle, rapid turnover. Ask your jobber.



The Graton & Knight Manufacturing Co.

Automotive Division

Worcester, Massachusetts



Here's the equipment you need-

WEAVER

You know how necessary it is to inspect the interior of every casing that comes into your shop for any breaks or other trouble, be-fore putting in a new or repaired tube. With a Weaver Tire Spreader it's an easy job to thoroughly inspect every inch of the casing in a fraction of the time usually required. When the job goes out, you know it's right. And by being able to show your customers the condition of the inside of their casings, you'll sell more vulcanizing jobs and more new tires. Service like this will make new friends for you as well as hold old ones-and make profits grow.

WEAVER

Spreader Tire Changer

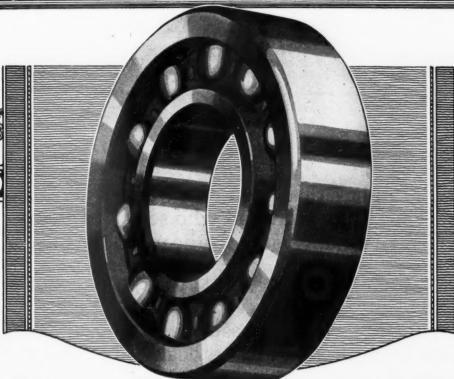
Practically every tire repair job that comes into your shop requires the tire to be removed from the rim. The time the Weaver Universal Tire Changer will save you, especially on the difficult jobs, will soon pay for it. Even more important is the increased patronage it will bring your shop. Car owners will be quick to realize the advantage of having their tires and rims handled on this equipment, quickly and efficiently, without danger of injury. They will drive miles out of their way to get this better service. It's up to you whether they go to your shop or elsewhere.



We'll gladly mail you a copy of our catalog describing our complete line of time and labor savers for the garage. Write today for Catalog

WEAVER MFG. CO., Springfield Illinois, U. S. A.

Weaver Canadian Co. Ltd., Chatham, Ontario



New Departure Ball Bearings

THE price of a car naturally limits the quality and workmanship of most parts that can go into that car. Hence, the statement often heard that a car is the highest standard of *value*.

Yet, when you come to ball bearings, only one grade is permissible—the best. Because ball bearings are so intimately connected with those things that are the very life of the car, you find New Departures in both the low priced and the finest cars.

The reduction of friction and the permanently accurate supporting and locating of gears and shafts are jobs which admit of no short cuts nor compromise.

And more than half of the ball bearings sold in the United States are New Departures.

THE NEW DEPARTURE MANUFACTURING COMPANY,
Detroit Bristol, Conn. Chicago



The policy that governs the New Peerless keeps in mind the man who sells the product just as definitely as it does the man who buys it.

It is animated by the belief that no matter how fine the product or how great the value, there can be no measurable success unless the best interests of the dealer are always a major consideration.

In brief, the dealer must make money.

Consequently, Peerless gives its representatives every possible co-operation to the end that the relations between maker and seller shall be mutually profitable. It strives to make those relations permanent.

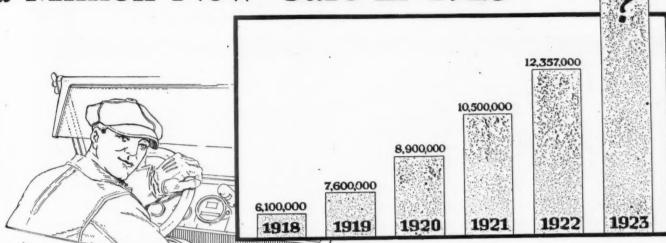
Thanks to the attitude of owners to the New Peerless and the attitude of this company to its dealers, Peerless representatives are building a substantial and permanent business.

If there is no Peerless dealer in your territory you can get full details by writing directly to the factory.

THE PEERLESS MOTOR CAR COMPANY CLEVELAND, OHIO

PEERLESS

Gasoline for at Least a Million New Cars in 1923



Who'll Get This Business?



What becomes of the additional business created by these motor vehicle owners who have increased at the rate of a million or more for the past five years?

If you haven't received your share of their business in the past, this Gilbert & Barker gasoline pump will help you get it now. Motorists must have gasoline and they will patronize this accurate reliable G & B pump, which brings you into continuous personal contact with the trade.

No better opportunity to increase your business and profits could be wished for. Install one of these Gilbert & Barker pumps and when they stop for gasoline "ask them to buy" the other articles they need.

> Ask your oil man NOW for information and prices on Gilbert & Barker pump equipment that will attract this business to you. In case he cannot supply it write us direct, mentioning his name and address.

Things you should know About Gilbert & Barker Pumps

1. Gilbert & Barker pumps are made by one of the larg-est manufacturers of measur-ing pumps in the world.

ing pumps in the world.

2. Their positive piston stroke principle of operation has been proved by years of service to be the safest, quickest and most accurate method of measurement.

3. Engineering skill has simplified construction to the fewest possible parts. There is no intricate or delicate mechanism to get out of order.

4. The operating mechanism of the pump is completely enclosed and protected from dirt, dust, and bad weather.

5. The quick return of the piston which is automatic and doesn't have to be cranked down, saves the time and energy of the operator.

erator.

6. The square deal dial and quantity indicator gives visible evidence of accurate measure to your customers.

7. The handsome appearance of G & B Pumps and their ample advertising space attracts trade, builds business and increases profits.

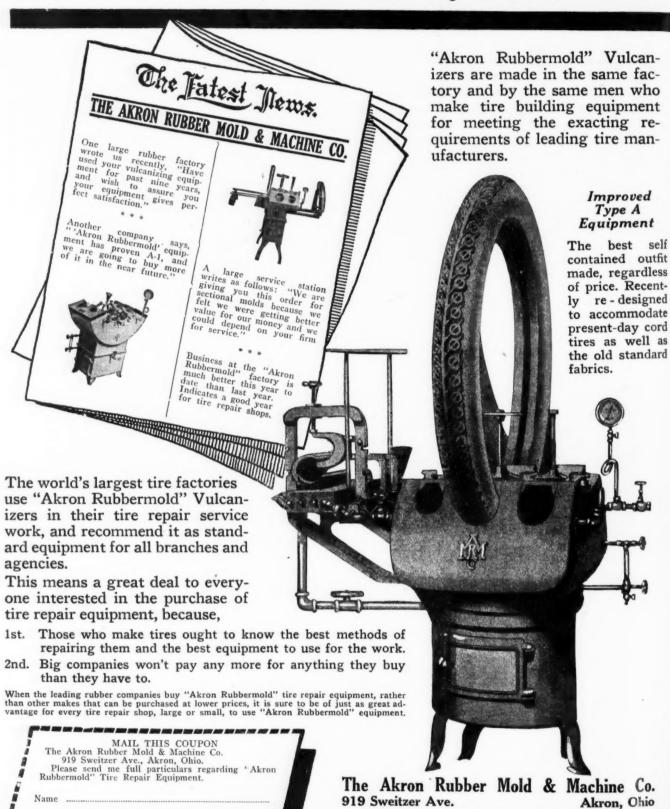
ORAGE EQUIPMENT

SPRINGFIELDMASS.

Address

MOTOR AGE.

AKRON-RUBBERMOLD TIRE REPAIR EQUIPMENT



World's Largest Producer of Tire Building Equipment

High Efficiency Vulcanizer Equipment for Tire Repair Shops

1923

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The accompanying reproduction of the Biflex ad, which appears in the Saturday Evening Post, April 28th, shows how Biflex is building consumer confidence and prestige for Biflex dealers.

Biflex is backing up its dealers with a sound, effective and profitable merchandising campaign. Bumper buyers are being told the facts in the big national publications.

This ad will cause thousands of motorists to think; to defer buying bumpers until they locate the Biflex dealer. Take this tip—

Write for the Biflex Dealer Proposition

Get lined up with Biflex—the Bumper with the established reputation for quality, protection, strength and beauty. It's the Bumper that insures volume sales and quick turn-over. No dead stock; sure sales and sure profits. Live dealers everywhere report an unprecedented demand for Biflex.

BIFLEX PRODUCTS CO., Waukegan, Ill.

This ad appears in the Saturday Evening Post, April 28th.

Will you be ready to back it up, or will you have to resist the demand and offer excuses and substitutes to Biflex prospects?





The Seal that guarantees 100% satisfaction to both owner and dealer



Any dealer can buy one; any dealer can sell one

Fill in and mail coupon below for details

Baltimore, Md., 1718-20 North Charles Street Boston, Mass., 872 Commonwealth Avenue Chicago, Ill., 2247 South Michigan Avenue

Cincinnati, Ohio, 813-817 Main Street Cleveland, Ohio, 2122 Euclid Avenue

Kansas City, Mo., 1908-10 McGee Trafficway New York City, 38-40 West 62nd Street New Haven, Conn., 71 Whitney Avenue

FILL IN AND MAIL TODAY

R & V MOTOR COMPANY, East Moline, Illinois

Gentlemen: - Kindly give me full information how I may sell the R&V Knight for a net profit, without obligating myself.



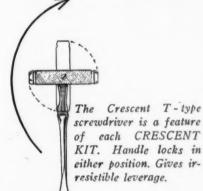
Wrench — 8 inch, single end genuine Crescent of drop-forged carbon steel, attractively polished and Crescent guaranteed.

Pliers - the popular Crescent 6-inch thin straight nose type, finely nickeled, hand polished.

Screwdriver—special Crescent improved T-type.

Handle can be turned at right angles giving tremendous leverage for tough work.

Retail price\$2.35



Motorists Want the CRESCENT KIT

—because it's "always ready for service" and because it is a set of genuine CRESCENT TOOLS

ANNOUNCEMENT

Here's how we are telling the CONSUMER about the CRESCENT KIT

You already know about Crescent merchandising and the Crescent guarantee of satisfaction which backs you to the limit in pleasing your customers. Here, now, is another important step in our progress—a national advertising campaign to the CONSUMER This campaign is sending motorists into garages, accessory stores and hardware stores all over the country to ask for the CRESCENT KIT.

Watch for Our Advertising in the Following List of Publications:

SATURDAY EVENING POST MOTOR WORLD MOTOR WORLD MOTOR AGE AUTOMOBILE DEALER & REPAIRER

—and you know what that means; special heattreated carbon steel, sawed out wrench bearings that stand the strain and always permit free adjustment of jaws; clean cut lines and easy balance that make a man welcome an excuse to get them out.

NOW—here they are in a handy compact kit that doesn't have to be buried under the seat. The Crescent Kit rides in the side pocket and is ALWAYS READY for instant service.

Your customers and those you want to turn into customers, want the CRESCENT KIT and you'll want them to have it for we have a mighty attractive proposition to make to dealers.

Look over our advertising plans in the column at your left, and then order a sample kit from your jobber.

CRESCENT TOOL COMPANY

"The Crescent Wrench people"
JAMESTOWN, N. Y.



TROY Trailers are showing amazing savings in hauling bulky materials which take up a great deal of space in proportion to their weight.

TROY Trailers are making it possible to haul long lengths which will not go on the truck alone.

TROY Trailers are showing big profits on short haul work where the truck is used as a tractor and carries no load.



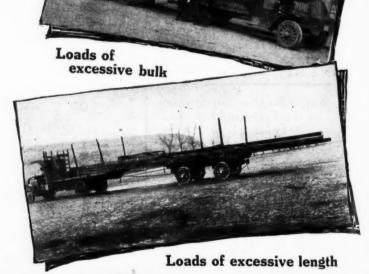
Troy Trailers

TROY Trailers are making great records in long-distance, overland hauling, where the cost with trucks alone is prohibitive. TROY Trailers are serving factories, mines, farms and stores, hauling everything, everywhere.

We still have some very desirable territory open and if you are interested in taking on a real money making line write for full particulars today.

THE TROY TRAILER & WAGON CO.

Mulberry Street, Troy, Ohio



will operate with ANY good truck

PRIZES

Grand Prize-\$150 worth of Starrett Tools at list prices as given in Starrett Cat. No. 22 and Revised Supplement. Second Prize-\$100 worth of Starrett
Tools at list prices as given in Starrett Cat. No. 22 and Revised Supplement. Third Prize - \$50 worth of Starrett Tools at list prices as given in Starrett Cat. No. 22 and Revised Supplement Fourth Prize-\$25 worth of Starrett Tools at list prices as given in Starrett Cat. No. 22 and Revised Supplement. Next 20 Prizes -\$10 worth of Starrett Tools at list prices as given in Starrett Catalog No. 22 and Revised Supplement.

Next 50 Prizes—\$5 worth of Starrett Tools at list prices as given in Starrett Cat. No. 22 and Revised Supplement.

Next 400 Prizes—\$2.50 worth of Starrett Tools at list prices as given in Starrett Catalog No. 22 and Revised Supplement.

Total 474 prizes having aggregate value (list prices), \$1775.00.

Judges

(Decision of judges is

Prof. Robert H Smith
ProfessorofMachineShep
Practice, Mass. Institute
of Technology.

Prof H. P. Fairfield
Professor of Machine Construction, Worcester
Polytechnic Institute.

Mr A. H. Starrett
The L S. Starrett Co.
Athol, Mass.



A Starrett "mike" for ten minutes' work! How Will You Trade?

The L. S. Starrett Co. offers 474 prizes of Starrett Tools (in sets and individual tools totaling \$1775.00—list prices—in value) for the best letters on "How Starrett Tools have helped me most in my work." If you are a Starrett Tool user don't fail to enter this contest. Write your letter today. See "A" below for points to cover. Never mind the big words—literary skill doesn't count in this contest—plain statements of facts—practical reasons why you prefer Starrett Tools will win. Yours may be the letter that brings the Grand Prize, \$150 worth of Starrett Tools (list prices) of your own selection.

Get all the details of this remarkable contest (rules, description of prizes, etc.) at any store selling Starrett Tools.

Ask for the Starrett Prize Contest Booklet. It's free. Write for copy if dealer can't supply you. Ask also for Catalog No. 22 RB a great help to contestants.

lave Helped Me

The World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
ATHOL, MASS.

THE L. S. STARRETT CO.



Δ

Write your letter on this subject
"How Starrett Tools Have Helped Me
Most In My Work"

Cover these points:

1. Superior features of Starrett Tools.

2. Advantages of any particular Starrett Tool.

3. Number of practical uses I have found for the tool chosen above.

Note- Contestants to be eligible must have used Starrett Tools prior to Feb. 10, 1923. Idail to Contest Editor, The L. S. Starrett Co., Athol, Mass., not later than April 15, 1923.



Starrett Prize Contest



Cut Your Overhead With OveR-Way

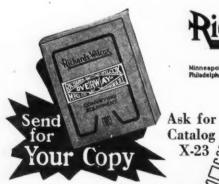
It's an expensive proposition when highly-paid mechanics must spend their time moving heavy loads around. Install an OveR-Way Conveying System in your garage and end this needless waste of time and money.

This ideal garage helper does the work of six men for less than the wages of one. It will hoist heavy engines and other loads with ease, and transport them quickly from one part of the shop to another. It speeds up work, saves the time of expensive men and means quicker service and greater satisfaction to your patrons.

Ask for

X-23

Without the slightest obligation to you, our engineers will gladly make an analysis of your requirements. Write today for further particulars regarding this free service, as well as for a copy of Catalog X-23.





A Guarantee of Quality





Reo finds Formica Timing Gears silent and durable

THE Reo Motor Car Company was one of the earliest users of Formica silent timing gears.

They have found the results satisfactory. Their motor is silent and remains so for many thousands of miles. There are no adjustments to make, and replacement on account of wear and tear short of 30,000 miles is rare.

Reo's long experience has proved the use of a crankshaft gear of Formica and a

Formica idler in a four gear train to produce the best results.

From the photograph it will be noticed that the crankshaft gear has a Formica ring in which the teeth are cut, and a metal center; the idler is solid Formica with a metal hub.

This use of Formica in the smaller gears offers an installation that is moderate in cost, perfectly silent, and relatively easy to fit. The percentage of tear down is very low. Write for the facts.

THE FORMICA INSULATION COMPANY

4642 Spring Grove Avenue, Cincinnati, Ohio

FORMICA

Made from Anhydrous Redmanol Resins
SHEETS TUBES RODS

What's your way of inspecting battery plates under charge?

It's the condition of the plates—the rate of charge-the gravity of the acid-the percentage of antimony in the grids and the temperature that determines the progress made in recharging a battery. That's why all batteries do not respond alike.

And this emphasizes the need of a periodic check of the voltage to observe how the individual plates are taking the charge.

The Cadmium Test-made possible with a Hoyt Cadmium Meter and Prods-is the only correct means of checking the capacity and progress of the separate battery plates under charge.

Its voltmeter tells you their exact condition at a glance--without tearing the cell apart.

The critical times to make Cadmium readings are: just before complete discharge at a normal 8-hour rate, just when the cell should be fully charged, and at the start of the finishing rate.

Our literature gives the details.

Every battery man will be interested in the latest issue of "The Cadmium Test"— giving some timely hints on successful battery charging and repair.

Sent, upon receipt of ten cents to pay for

THE BURTON-ROGERS COMPANY

755 Boylston Street, Boston, Mass. Branch Offices and Distributors in all principal Cities.



BURTON

W HO Is It
—that extends you credit
that would be difficult to obtain
from strangers hundreds of
miles away?
—that sells you merchandise at
a price never more than you
could get from its makers—and
sometimes less?
—that gives you friendly advice,
caution and counsel, who advises
against certain purchases and
urges certain others?
Shake hands with the next jobber's salesman who calls upon
you.

TO A CONTROL OF THE OF

The Best-Equipped Shop Gets the Business"



Empire

Cord Tires

Wear Longest"

'mpire

Peerless

Red Tubes

Best in any



Check Up on the Tire You Sell

We invite you to compare the EMPIRE TIRE with the best of today—yesterday—three years ago. During the era of price competition we were careful to leave size, weight and durability untouched, cutting only needless expenses and burdensome overhead in order to allow the dealer to make a generous profit but still uphold his—and our—reputation.

One of the reasons for the never-failing high quality of EMPIRE TIRES and Tubes is briefly explained in

EMPIRE QUALITY QUALIFICATION NO. 2

A Tire That Bears Comparison

Many dealers who buy tires by name alone are surprised when they compare Empires minutely with other tires. In the matter of weight, skim between plies and thickness of tread, Empire casings are unsurpassed by any tire on the market, despite the low price at which they are sold to dealers.

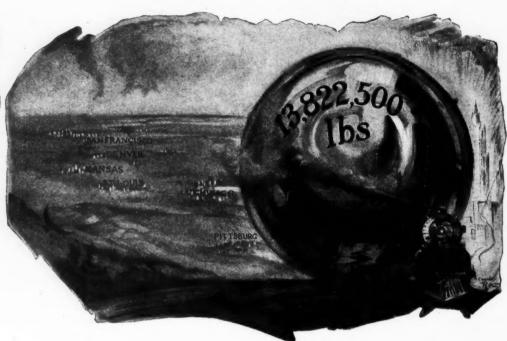
You Owe It to Yourself

to meet the present demand for QUALITY with a tire that still allows you a generous profit. Write today for our attractive dealers' proposition. Dept. 204.

Empire Tire & Rubber Corporation

FACTORIES TRENTON, N.J. U.S.A. MAIN OFFICES





A Half Billion Steel Balls Of Highest Quality, from Forty-Foot Sphere

OVER a half billion balls of highest quality, averaging one half inch in diameter and weighing approximately 9,215,000 pounds, represent the output of the Atlas Ball Plant for the past 14 years. Approximately 13,822,500 pounds of raw material—sufficient to form a ball of almost 40 feet in diameter—were required for this output. If placed one against the other in a line, these balls would extend from New York City to San Francisco and 754 miles beyond.

Fourteen delicate operations are involved in making a finished ball

after the raw material itself has been subjected to rigid tests and inspections.

The resultant product possesses great endurance in service, is perfectly finished and so true to size that the permissible tolerance—plus or minus ½ of 1/10,000"—is so small that merely blowing one's breath on a half-inch ball expands it sufficiently to cause the ball to register "off size."

Such quantity, quality and accuracy indicate the extent to which Atlas balls meet the requirements of the most exacting user.

ATLAS BALL COMPANY

Glenwood Ave. at Fourth St.

Philadelphia

937

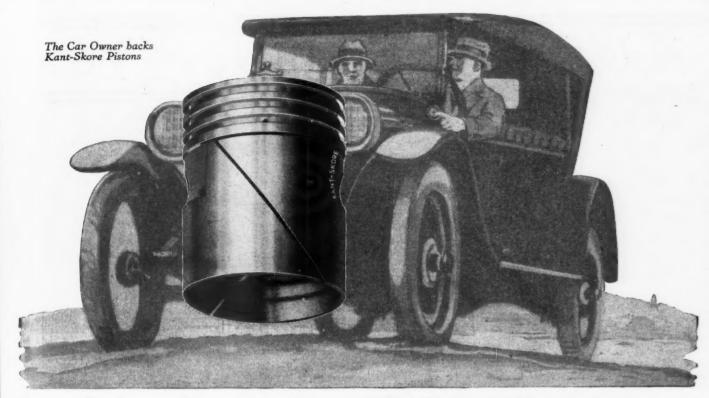
ATLAS
ALSO BRASS, BRONZE,

MONEL AND SPECIAL METALS

Made Under

SKF

Supervision



The Spiral Slot Produces Satisfied Customers

70U can turn out a satisfied customer every time you install a set of Kant-Skore Light-weight Close-fitting Pistons.

The performance which pleases your customer is due to Kant-Skore construction. - Kant-Skore Pistons can be installed at the closest known fit, yet they won't freeze or stick. They are made of an alloy onethird lighter than cast-iron, but they cannot slap.

The Spiral Slot Does It.

The patented spiral slot—an exclusive Kant-Skore feature -is the explanation. The spiral slot eliminates expansion difficulties by taking care of the heat expansion of the piston. It is a self-adjusting slot and allows the piston wall to give so that at all times the piston fits snugly in the cylinder bore with a constant clearance.

Satisfied customers are the back-bone of a business. They are your best advertisement. Install Kant-Skore Pistons in your replacement jobs. Put them to work for you. Satisfied customers are your first result. A growing business with increasing profits soon follows.

Mail the coupon today for our folder which tells you how to go after the replacement trade in your territory.

THE KANT-SKORE PISTON CO., Dept. E., CINCINNATI, OHIO Factory Branch: 1514 McGee St., Kansas City, Mo.



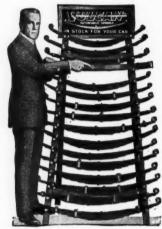
WEIGH LIGHTEST . FIT TIGHTEST.



The Garage Owner boosts them

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Ask Your Jobber for



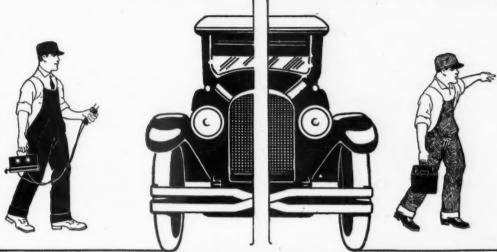
Rack FREE with Your Initial Order for 25 Springs



SPRINGS

JENKINS VULCAN SPRING CO., RICHMOND, IND.
Boston Dallas St. Louis San Francisco Portland Seattle

Cut the Cost of free service



Bring the test set to the battery ~ Not the battery to the test set!

Free service is mighty expensive service for the battery station. The most expensive feature of free service is the time required to locate trouble in the starter circuit. Is the trouble in the starter or in the battery, or is it in one of the electrical connections? These questions must be answered by the battery man several times a day as part of his free service. To locate these troubles with a poor or makeshift test set is a slow job. It brings no profits and results in poor service.

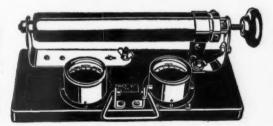
The profit-making battery man uses portable testing equipment, and benefits in two ways: 1st, because of quicker and better service; 2d, he cuts the cost of free service. The up-to-date battery man brings his Allen-Bradley test set to the battery. The shiftless battery man wastes a lot of time removing the battery for testing and more time replacing it. Be up-to-date and make real profits this year from free service by installing a profit-making Allen-Bradley test set.

The Allen-Bradley Test Set

is a portable, indestructible and profit-making battery tester. It is approved by all leading battery manufacturers and is recommended by most of them to their service stations as the best test set for service station use.

Heavy test clips and cords, voltmeter prod, voltmeter, ammeter and genuine Allen-Bradley graphite disc rheostat, are furnished with each test set.

REMEMBER—The well equipped shop gets the business.



This is the Allen-Bradley Type L-2502 high rate discharge test set, ruggedly built for strenuous battery station service.



The Allen-Bradley Test Chart

is a special feature supplied with every Allen-Bradley test set and is an elaborate wall chart in color which analyzes every battery trouble and recommends the proper remedy. In addition, it contains many valuable tables for everyday use in battery sales and repair work. Let the Allen-Bradley test chart answer your customers' questions by showing them in black and white the causes of their battery troubles.

Allen-State Discharge Test Set.

Milwaukee, Wiss

Please mail your latest bulletin on battery testing and explain how we can increase battery sales and crease battery sales and



Stop This With Snubbers

HOW many times have the rough spots shaken all the pleasure of the trip out of you?

Gabriel Snubbers give you comfort by keeping the springs under control and smoothing out the bumps. Endorsed by the manufacturers of 71 cars.

Sold by legitimate dealers

GABRIEL MANUFACTURING COMPANY
1415 East 40th Street Cleveland, Ohio



SNUBBERS



THERE IS NO OTHER

Keep You On The Seat-Save Your Car



Where is your Market?



ere is your Mar

8.9% of the total population served by any city have the means with which to buy a Columbia Specialized Six

Midday—an automobile salesroom—in comes Mrs. Stuyvesant—she carefully looks over the Coupe near the window—she goes out with the salesman for a demonstration—and comes back to sign on the dotted line. Fifteen minutes later; same showroom, same automobile; in comes Mr. Sweeney—he likewise looks over the car and goes for a demonstration—and also signs on the dotted line. Query: Mrs. Stuyvesant is worth a cold million—Mr. Sweeney a scant two thousand. Why did they both buy the same automobile?

A scenario you'll recognize. It's being played in a Columbia salesroom somewhere every day. Yet down deep in the plot you'll find a moral that is of vital importance to every automobile dealer. A moral that holds the key to success or failure in the automobile business.

Are You Selling a Popular Type of Car at a Popular Price?

Some dealers are making money selling high priced cars. Others are building volume profits on inexpensive cars. But the dealers who are making the most money—and by that we mean the most successful dealers in any city—are the ones who are selling a popular type of car at a popular price, (the kind of automobile the largest percentage of people are in a position to buy).

Definite figures from a recent survey in 684 cities prove that 8.9% of the total population served by any community have the means with which to buy a Columbia Specialized Six. With the Columbia line you can easily reach 85% of all types of car buyers with an unmatched value.





ticular neighborhood, class, or financial group—your prospects are everywhere, and your sales possibilities unlimited.

The Columbia dealer franchise provides a progressive business man with a merchandising proposition in which he can make more money, more easily, than he has ever been able to do before. It places in his hands a car of genuine value-and backs him with merchandising cooperation that is unusually aggressive and remarkably effective.

And, too, it places in his hands a car with an established reputation for a satisfactory performance. The Columia all-feature chassis, built from units such as Continental Motors, Timken Axles, Borg & Beck Clutcheshas been quickly accepted by the automobile buying public everywhere.

serves right. Columbia service costs are low, because the car stands up as few low-priced automobiles have ever been known to do. In addition, every one of the major Columbia units are guaranteed by its maker-not one but a dozen great organizations are vitally interested in making every Columbia owner a satisfied customer.

The Columbia line is easy to sell because of the value of the cars and the extent of the market: it is made easier still by means of a thoroughgoing factory sales cooperation. Moreover the investment required to handle the Columbia line successfully is exceptionally small. The factory requires each dealer to make a representative showing of the line, but does not insist on him stocking up with all the traffic Sixes is larger than is usually obtained on a popular priced car, because the dealers we want are the men who expect and get, better than the average return on their investment.

The final test of any profit-making opportunity is its permanence. Columbia Motors Company itself is a strong and substantially successful organization. And back of Columbia's ability to give service, stand a group of the world's greatest parts manufacturers. The engineering resourcefulness of Continental, Timken, Spicer, Borg & Beck, Durston, Auto-lite and many others, is constantly making possible the production of a better Columbia Six, just as the facilities of these great concerns for economical large scale production are continually enabling Columbia to give more for the money.



Columbia is just as much in the business of building dealers as it is in building cars. In addition to producing a fine line of cars at attention-compelling prices, Columbia backs its dealers with a type of sales cooperation that means greater volume and bigger profits.

We provide Columbia dealers with a complete line of beautiful, dependable, six-cylinder motor cars. The Touring Car, with a number of refinements. A new and much improved Sedan—the lowest priced, specialized construction, six-cylinder Sedan on the market. An entirely new model, the Two Passenger Coupe.

In addition, we offer the Special Phaeton, which gives the fine finish, the completeness of equipment, roominess and quality of performance never before matched at near this low price. The new Columbia Sport Touring, with its special blue or maroon finish and khaki style-cut top, touring trunk, and wealth of extra equipment at a price well under competition.

Finally, a new special Touring car—one you have never seen. A complete new job at a price years ahead of the market—a car that will establish a new value for all automobiles selling at about \$1,000—a car that is designed to out-sell any job we have every put on the market before. This splendid new five-passenger Touring car with all-steel body is now in production, daily deliveries being made in large numbers. Information regarding this splendid addition to the Columbia line is now being given to the dealers who are actually interested in the Columbia merchandising opportunity.

To responsible business men everywhere, the Columbia franchise offers unlimited profit-making possibilities. Act at once! Get in touch with our Sales Department immediately. Let us tell you how to make more money in the retail automobile business—Now!

COLUMBIA MOTORS COMPANY, DETROIT

brings perfection

Columbia Specialized Six and specialization

\$5.00

for Ford Dodge Chevrolet



Here It Is— a Real Gasoline Gauge

An absolutely dependable gasoline gauge that can readily be installed on the instrument board of any Ford, Dodge or Chevrolet.

The Carter Gasoline Gauge is made without floats or springs — nothing to get out of order. It is guaranteed accurate under all conditions.

Most leading jobbers carry Carter Gauges. National advertising is building a ready market. Every one of the millions of Ford, Dodge and Chevrolet owners need a Carter Gauge. Write us if your jobber cannot supply you.

CARTER MOTOR ACCESSORIES, INC. 388 PEARL ST. BUFFALO, N. Y.

CARTER GASOLINE AND OIL GAUGES



good reasons why dealers handle

American

了で

「記録」

Piston Rings

- 1 A Quality Product
- 2 Every Size & Oversize
- 3 Nation-wide Distribution
- 4 Well advertised
- 5 Tremendous Market
- 6 Low Price

Factory List Price (2½"-4½")-60 ¢
To fit Fords-To fit Chevrolets 50¢

ask your Jobber

AMERICAN HAMMERED PISTON RING COMPANY, Baltimore, Maryland Export Department, 461 Eighth Avenue, New York, U. S. A.





You Service Every Car On the Market with 6 Sizes

Yes Sir-6 Red Tops do it alland every plug is a live one

You profit by a smaller investment in your plug stock—a quicker turnover—no sizes that "stick."

Every Plug Is a Seller

Further—the Red Protector Cap eliminates any form of accidental porcelain breakage. It makes the Spit Fire distinctive in appearance and gives your customer more spark plug value than he can buy in any other plug.

Mosler has made spark plugs since 1898—that's 24 years of spark plug manufacturing experience.

Spit Fire Is Time Tested

Clean merchandise—a clean policy—sold only through jobbers—you will have no price cutters to buck. The Ford size lists 60c. All other sizes at \$1.00.

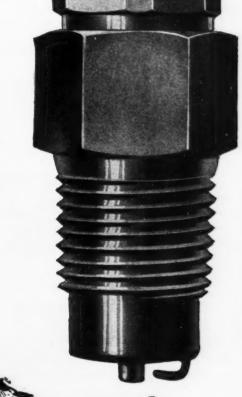
The six sizes in order (as illustrated) are: Metric—S.A.E.—Buick Special—S.A.E. Long—Ford Special—7/8 Standard. Remember—these six plugs cover the needs of every car on the market.

Spit Fire is an entirely distinctive line priced lower to you than any other standard plug. It's the best plug proposition ever offered. Get in touch with us at once.

MOSLER METAL PRODUCTS CORP., MT. VERNON, N. Y.









AUBURN



6-43 Touring \$1095







6-63 Touring \$1650



6-63 Sport \$1895



6-63 Brougham \$1965



6-63 Sedan \$2245

Value makes these cars easy to sell!

THE dealers who sell them are doing fine. The factory that makes them has hung up a record for new dealer and distributor connections since these new cars were announced.

Auburn hit the bull's eye with its new models this year. The response from dealers and the public was immediate and it came with a rush.

A Complete Line

A series of smaller Auburn Sixes — big, spacious, handsome cars selling with the touring body for \$1095, was wanted. This is made in a full metal paneled touring-sedan at \$1465.

A high powered 70-mile-an-hour chassis — the equal in acceleration and hill-climbing ability of the most famous high powered cars — to sell for many hundreds of dollars less, got a big welcome.

Liberal Terms

Dealers and distributors like the liberal terms of the non-expiring franchise. It assures them of a real profit. They like the fine treatment of the Auburn factory, and the perfect freedom from serious service expense.

They appreciate the great national advertising campaign—and the liberal advertising and sales support in their own territories.

Your Territory May Be Open

Some one is going to build a big profitable business in your territory with these cars. Better to get in line now than regret it later.

Write or wire today

AUBURN AUTOMOBILE COMPANY

Auburn, Indiana

R AUBURN ESTABLISHED 1900



"East River boatmen were amazed to see a man come bursting through the surface."

Safety!

Model 965

Heavy Duty Assembled Unit

The operation of this giant outfit is smooth and silent as an 8-cylinder motor. It is free from vibration, the Brunner Compressor (No. 105) being of balanced load type, with all running surfaces ground and polished. Ample capacity for largest and busiest filling station, even handling three or four air - driven gasoline pumps. Compressor capacity 6 cu. ft. free air per minute at 350 R.P.M. Heavy, seamless, 65-gallon tank, clamped in place with four heavy iron straps. Years of constant operation will not affect the rigid stability of this rugged and reliable outfit.

AIR Pressure is a force to be reckoned with.

It is a friendly force when properly handled. It keeps the windmills going. It fills the sails of ships. It cushions the road for motorists.

It is a powerful force. It sets in motion tremendous mechanical devices. It holds back tons of water while human pygmies work in caissons building tunnels for commerce.

And, like all powerful forces, it holds elements of danger unless properly controlled. One day boatmen on the East River were amazed to see a man come bursting through the surface and sail 15 feet in the air. He'd been blown through several feet of mud and 20 to 30 feet of water from a leak in the compressed air chamber of the subway tunnel then under construction.

An Air Compressor produces this Force. It should also properly control it. Its equipment should be such that no point will be reached when the pressure is likely to burst its bonds. Automatic, inbuilt safeguards must do what the operator might forget to do.

BRUNNER Compressors and equipment are built to control a much higher pressure than they are ever called upon to resist.

BRUNNER Tanks are double-tested. Brunner Piping is tight, and strong beyond its requirements. No part will fail.

Just as the "20 BRUNNERISMS" (established habits of mechanical excellence) assure you Speed, Silence, A Quick Sure Start, and Economy of Operation—so do they assure you of Safety limits set far beyond the danger line.

No Brunner Compressor or equipment has ever failed in the twenty years that we've been building them.

Your Jobber Carries Brunners, Ask HIM about them.

BRUNNER MFG. CO., UTICA, N. Y. Oldest and Largest Manufacturers of Garage Air Compressors in the World.

Cincinnati 1st Natl. Bank Bldg.

Kansas City 1805 Grand Ave.

San Francisco 607 Santa Fe Bldg.

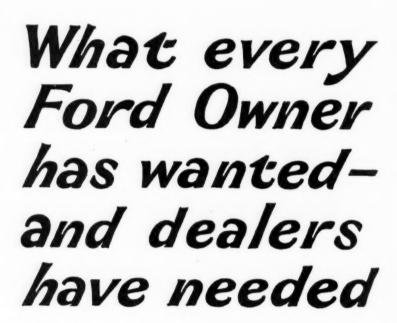
"Good for Twenty Years at



Hard Labor"

TYPE

The new In Sold In Sol



Here's value with a vengeance!

A big, rugged, waterproof ignition system for Fords—built by the makers of the world famous Bosch Magneto—and selling at only \$12.75.

It has automatic spark control, scientifically accurate timer, and is the longest lived Ford ignition system you can buy under \$25.00.

It's a quick, easy seller—and a big profit maker.

The Bosch De Luxe System, Type 513,

is made for Fords using storage batteries. This system, which includes the Bosch Coil and Compensating Governor, becomes a definite part of the engine. It is extremely popular, as it gives wonderful service—thousands are sold monthly. Price is \$25.00 complete.

Ignition System

for Fords

Keep a crowd around your booth at the auto show—

Bring new customers into your store daily—

Keep the boys in your shop busy making installations—

Keep your stock turning over rapidly at a liberal profit—

Make sales easy for your salesmen—

Widely advertise your place, and greatly increase your prestige—

Make 1923 a record breaker in sales.

Type 600 sells on sight! It looks like \$25.00 worth, and works still better.

Every customer becomes a booster. You sell him, and he sells his friends—

Get started! Thousands of dealers are making this their 1923 leader—it's going to be a Bosch-Ford year.

Wire for sample fitting C.O.D. and full particulars about New Sales Plan.

AMERICAN BOSCH MAGNETO CORP.

Springfield, Mass.

NEW YORK

CHICAGO

DETROIT

SAN FRANCISCO

What it does

- 1-Makes Easy Starting
- 2—Keeps Plugs Clean
- 3—Prevents "bucking"
- 4—Gives More Power
- 5—Saves Gas and Repair Bills
- 6—Stops Timer Troubles
- 7-Pays for Itself
- 8—Prevents Short Circuits
- 9-Cuts Down Vibration.
- 10-Eliminates Spark Lever

\$16775





Compressed Asbestos Sheet Packing

The old, reliable sheet, Tenax, never varies and is famous for its splendid performance and long life. The "Original blue sheet"—a quality product of a quality line.

Tenax is an ideal sheet because it can't squeeze out, rot, burn or melt. When subject to cylinder explosions, gas engine exhausts, acid, alkali, ammonia, super-heated steam or any other active agent, Tenax is permanent.

Comes in size 50x50 inches, 1/32 to 1/8 inch thickness inclusive, in black graphited, blue and red sheets. Made in 1/64 inch thickness in black graphited sheet only.

Pack confidently with Tenax and forget the joint forever. This sheet has been preferred by expert engineers and bought by name for twenty years.



ADPASCO GASKET PAPER

A specially treated gasket paper that is firm, water-proof and oilproof. Adpasco is made for every use excepting in contact with extreme heat. Used in thousands of shops along with Tenax every day.

Made in sheets 36x40. Weighs about 12 ounces per sheet.

PERFECTION PUMP PACKING: A real need in pump packings supplied. Made of long strand flax, twisted hard and heavily graphited with high grade plumbago.

ASK YOUR JOBBER. "The Advance Line" is carried by all good jobbers. If he can't supply you, write us direct.

Advance Packing & Supply Co.

66 East Lake St.

Chicago

Distributor: Allied Industries, Inc., San Francisco, Los Angeles, Seattle



"Make It Ten"

That's what the motorist says when he sees that you have a *TEN* gallon Visible Pump. Call his attention to it, tell him it saves another stop for gas—possibly at a blind pump where he can't see what he buys. You will sell more gas and make more money!

American EVisible Curb Pump

The advantages of this ten gallon pump are obvious. You can serve *five* gallons from it, or any smaller quantity, as easily as from a smaller pump—and if ten gallons are wanted you can serve it *quicker*.

And more and more is the motorist buying ten gallons to avoid undesirable stops.

The American Ten Gallon Visible has all the valuable features of the five gallon pump—hand operated, absolutely safe, gasoline is filtered, and an accurate meter that registers gasoline pumped into container furnished without extra charge.

Write for our *very reasonable* prices and full information.

CONTAINERS

Either five or ten gallon visible containers for other makes of pumps furnished complete with full instructions for attaching.

The American Oil Pump & Tank Co.

1159 FINDLAY STREET,

CINCINNATI, OHIO

SIMILY WATER SEAT DEAMED

Does Your Shop Toe the Mark?

UNLESS it is equipped with tools that insure efficiency, accuracy and speed you cannot expect it to increase your profits and reduce your overhead.

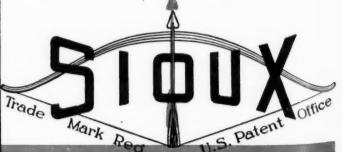
"Sioux" Tools mean more and better work at smaller cost.

You can save hours of tiresome valve grinding by removing the carbon pits and other irregularities from valve seats with this rapid cutting and absolutely accurate Sioux Reamer. There's a Sioux Valve Seat Reamer for every engine made.

No Chattering of valve seat. By inserting a piece of 50 lb. wrapping paper, large enough to cover valve seat, on the pilot stem between reamer and valve seat you avoid all possibility of chattering. A few turns will cut through paper. Write for free sample. Sells Them

Write for Catalog and Valve Seat Reamer Specifications
ALBERTSON & CO., SIOUX CITY, IOWA

"The Well Equipped Shop Gets the Business"





No. 5-A Reliable

A Ball-Bearing Jack with a 34-inch Detachable Folding Handle

The extra long, detachable handle makes this Jack easy to push under any axle. And once it is under, a few turns of the handle will raise the car with ball-bearing ease. No stooping, no straining—perfect operation.

Strong

All Reliable Jacks are sturdy and strong

Note the illustration—see the unusual broad base and oversize stand. Then there is a corrugated top with an inch and a half flip cap, resting on a full-size $\frac{7}{8}$ in. screw. Both gears are malleable. Built to withstand heavy strains.

Easy to Operate

All Reliable Jacks are easy to operate

Perfectly meshed gears ride on a thrust bearing and all are thoroughly packed in grease before leaving the factory.

Dependable

All Reliable Jacks are dependable

The very nature of the construction of this No. 5-A insures instant and unvarying dependability. The stand is completely sealed top and bottom—no chance for dirt or foreign matter of any kind to interfere with screw or gear action.

ASK 'EM TO BUY

Elite Manufacturing Company

Department MA4 Ashland, Ohio.

COMPLETE STOCK CARRIED BY: Northwest Branch—G. A. Ashton Co., St. Paul, Minn. Southwest Branch—Carroll Company, Dallas, Texas.

REPRESENTATIVES: Motor Products Company, 149 Church Street, New York.
L. E. Spencer Company, 704 Stahlman Bldg., Nashville, Tenn.
A. E. Mohrig, 1454 Pine Street, San Francisco, Cal.



RELIABLE

The dealers who helped to sell the first 5,000,000 Reliable Jacks made real profits. Are you going to get your share of the profits of the sixth million? Fill in the coupon and get started now.

ELITE MFG. CO., Dept. MA4, Ashland, Ohio.

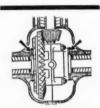
Please mail me one of these Jacks. You may bill me through my regular jobber, whose name is—

Name

Address

City..... State..... State....







4,850,000 Fords

-and they all need this!

Nearly 45% of ALL passenger cars now registered are FORDS. This gives you the biggest repair opportunity you have ever had.

All you need do is to show a Ford or Chevrolet owner how a Bantam F-40 reduces friction to a minimum.

Bantam F-40 takes the place of the plain washers now in the Ford Axle. It is built for hardest service.

Every owner wants better hill climbing, greater gas mileage, freedom from noisy gears and axle trouble. You can install F-40 in 90% of these cars in your town.

Your distributor carries F-40. If he cannot supply you, write to one of the addresses below.



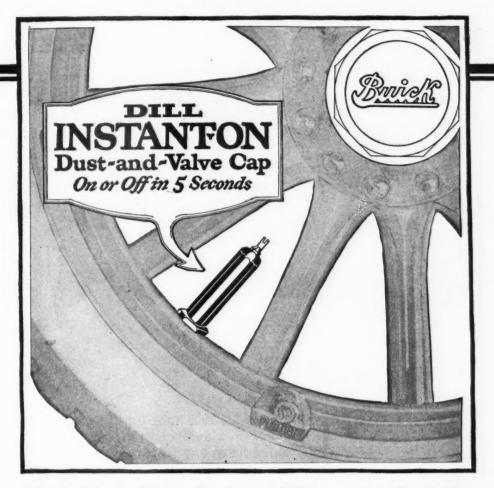
BANTAM BALL BEARING CO.,

Bantam, Conn.

Detroit Office: 905 Dime Bank Bldg.

F. M. Boyd, The Avon, 6 East Read St., Baltimore Frank M. Cobbledick Co., 103 Polk St., San Francisco





INSTANT-ONS and the Buick

O greater tribute could be paid the convenience and utility of the Instant on than its use by Buick on their tire equipment. Instant on is a dust cap and valve cap combined in one unit. It goes on or comes off in a few seconds.

No aggravating turning and twisting—just give Instant on a turn or two, slide it the rest of the way, lock it with another turn or two, and it's on.

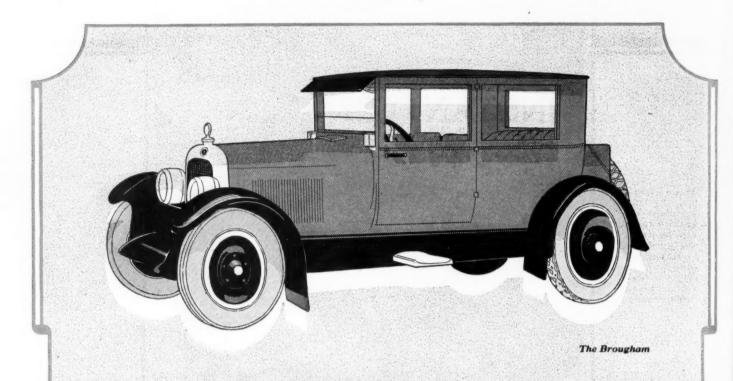
Every car should be equipped with Instant-ons. Sold in attractive display cartons by most good jobbers. If your jobber cannot supply you, write to us.

Retails at one dollar for a box of five

THE DILL MANUFACTURING CO., Cleveland, O.
Manufactured in Canada by The Dill Manufacturing Co. of Canada Ltd., Toronto
Also Manufacturers of Dill Standard Tire Values and Dill Value Insides

TireValves and ValveParts

The MOST COMPLETELY AND CONVENIENTLY LUBRICATED CAR IN AMERICA





Courier Features

Six cylinder, valve in head engine 46 Horse Power runs in bath of cool fresh oil. Full pressure dry crankcase engine lubrication. Transmission annular ball bearings throughout. Powerful easy acting brakes. Low hung chassis with ample clearance. Automatic chassis lubrication—pressure on plunger forces oil to chassis bearings, eliminating oil and grease cups and guns. Large headlights with non-glare lenses. 32x4 Cord tires. Bright nickel plated radiator shell. Custom built bodies built complete in the Courier Shops—roomy yet smart appearing. Rattle proof doors. Real Spanish leather in open cars. Choice of leather, imported or domestic fabrics in closed cars. Choice of five bright colors. Sport features for all models. Long, flat easy riding springs. Approximately 20 miles to a gallon of gasoline—over 500 miles to quart of oil and 12-15000 miles on a set of tires. If you want a car that is conservatively "different" and yet mechanically better get in touch with us.

DESIGNED and built for the man who wants a car that is not only distinctive in outward appearance but also embodies many features of construction that give long and carefree service, the Courier has attracted widespread attention among keen buyers of motor cars.

The choice of five colors, wood or disc steel wheels, running boards or steps, fabrics or leather for the upholstery of the closed models, with the option of sport equipment on all types, enables the buyer to express his own personal preferences in the Courier he drives.

The six-cylinder valve-in-head power plant runs in a bath of cool fresh oil at all times. Dry crankcase lubrication of the engine with its attendant advantages and automatic lubrication of the chassis, eliminating grease and oil cups and guns, reduce mechanical care to a minimum.

Attention to detail in the fittings and appointments of both the open and closed types is evident at even a casual glance, while further scrutiny reveals a thorough appreciation of all the "little" as well as the big things that mean so much in motoring comfort and enjoyment.

Are you alive to the sales opportunity with this car in your territory?

Nine Body Styles -\$1195 to \$2165 at Sandusky.

COURIER

THE COURIER MOTORS COMPANY, SANDUSKY, OHIO









Stock This COMPLETE Piston Service Line

Here is a wonderful opportunity for you to establish a profitable, *complete* Piston Service Station in your town! Inland now offers a full Piston Service Line—a superior Ring for every purpose and price, and a complete series of high-quality Replacement Pistons and Piston Pins.

Go after the big market for Inland Piston Products—there is a rich, steady harvest of profits awaiting you if you start now to build a solid business on this complete, high-quality line

Investigate Now!

Dealers, Auto Parts Companies, Reborers, Regrinders and Repairmen—this message means money to you! If you carry only part of the Inland line, round it out and increase your profits. If you want to stock this better and complete line, talk to an Inland jobber—in case you do not know his name, write us direct.

Our new booklet, "The Story with a Ring to It," tells the story of each of these celebrated Inland Products. Send for your copy now.



Branches and Stocks in Principal Cities

Main Office and Factory: St. Louis, U. S. A.



10











Sell This Lock With Every Car

YOU can sell a car with an Oakes Spare Tire Lock quicker than you can without one. Every car buyer KNOWS his new spare tire needs protection against thieves, and he's eager to get a good lock.

Show him this lock on the car. You'll speed up the sale, and make a nice extra profit. This lock makes an instant hit with motorists, because it does more than prevent tire thefts—it adds neatness and distinction to the car. In beauty, protection and convenience, it far outclasses rattling chains, ugly cables, flimsy padlocks and other make-shifts.

It is easy to install—simply replaces the rim wedge on the tire carrier. Made of unbreakable metal, with a high grade lock unit. Finished attractively—housing is glossy black, lock face is nickel-plated. Fits nearly all cars. Thousands in use. Standard equipment on 14 makes of cars. List price \$5.00 (Ford type \$4.00.) Liberal trade discounts. Order a dozen from nearest distributor or factory. You'll soon need more.



Spare Wheels

Sell an Oakes Spare Wheel Lock on cars with disc or wire wheels. It baffles thieves and beautifies the car. Types to fit either center or off-center locking studs. Now standard equipment on several fine cars. List prices \$5.00 and \$7.50. Send for a sample lock and full sales information.

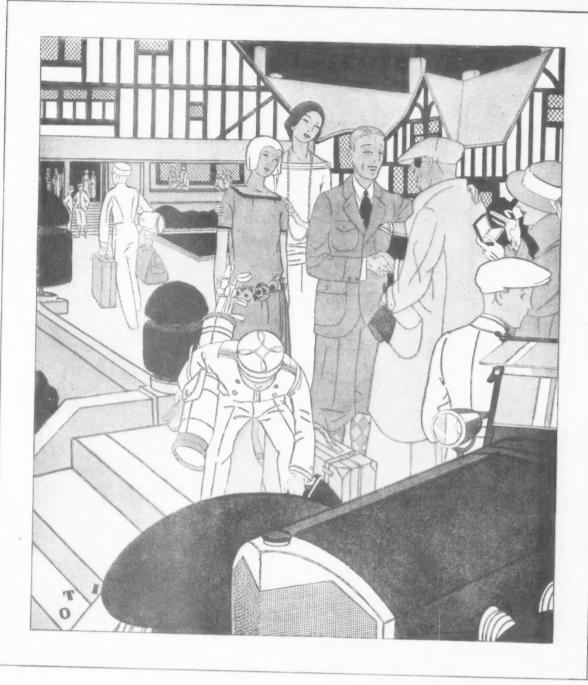
THE OAKES COMPANY

Est. 1910. Indianapolis, U. S. A.

Distributors of Oakes Locks

BOSTON—Hartford Shock Absorber Agency, 319 Columbus Ave, BUFFALO—D & W Sales Company, 1471 Main Street. CHICAGO—Auto Specialties Company, 23rd and Indiana Ave. DETROIT—Rex Sales Company, 320 Piquette Avenue. LOS ANGELES—Charles L. Mead Company, 1313 Figueroa St. NEWARK—Hartford Auto Products Company, 177 Central Ave. NEW YORK—Hartford Shock Absorber Agency, 106 W. 63rd St. PHILADELPHIA—F. C. Hornbeck, 309 N. 15th Street. RENO, NEV—M. R. Sloan, P. O. Box 471 ROCHESTER—D & W Sales Company, 261 Central Avenue SEATTLE—Miller-Lowe Tire Comp any, 1122 Pine Street.

OAKES Spare LOCK



"Which Road Did You Take?"

"How in Sam Hill could you get here an hour ahead of us? We've been moving some since we passed you near Three Forks.

"The short-cut? You don't mean that cut-off over the mountain! They told us that was terrible going. How did you ever make it?

"STABILATORS, you say! Well, I have had my doubts. But by George, if that's what brought you through, I can see why you've been talking so much about them."

Thus from one to the other is the STABILATOR story spreading throughout the whole motoring public.

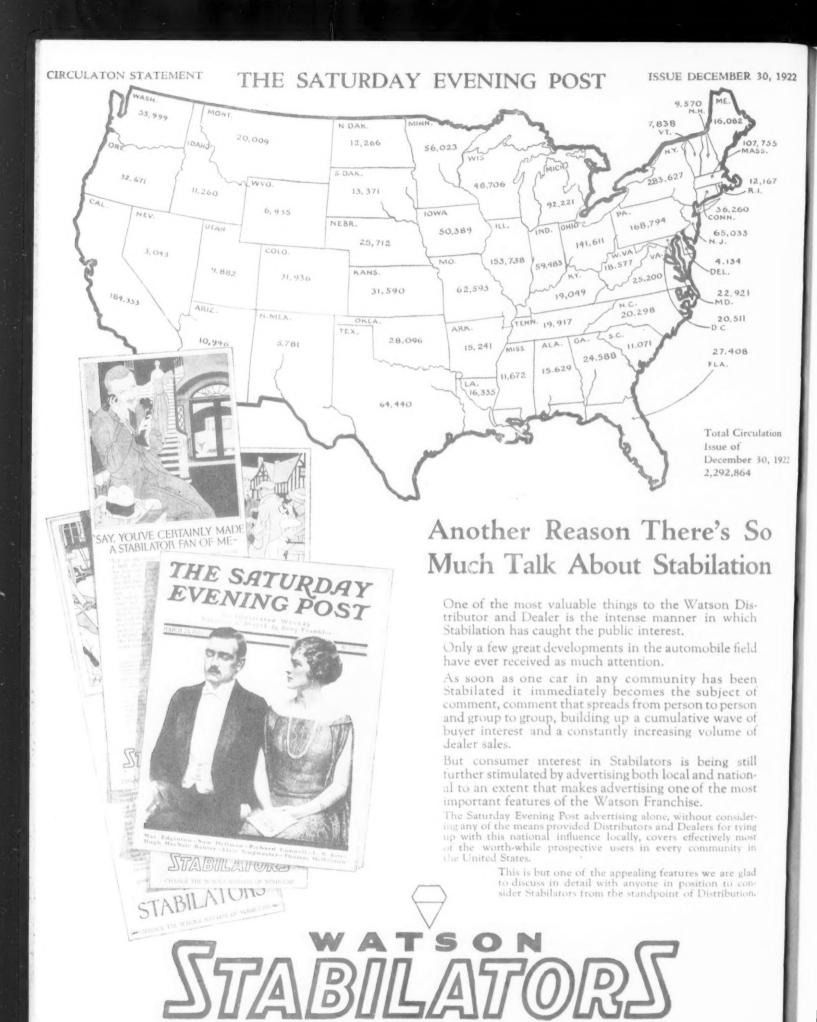
STABILATORS are a scientifically correct means of maintaining the stable equilibrium of the car body in spite of the pitching and throwing tendencies when traveling over all kinds of road surfaces.

Descriptive literature upon request.



JOHN WARREN WATSON COMPANY, PHILADELPHIA

CHANGE THE WHOLE NATURE OF YOUR CAR



CHANGE THE WHOLE NATURE OF YOUR CAR

JOHN WARREN WATSON COMPANY, PHILADELPHIA

A trifle too much

TRADE MARK



REG. U. S. PAT. OFF.

Like money in your pocket, a trifle too much oil on a Ford's bearings is better than just enough.

A blame sight better than too little.

Since we agree on that, let's consider how to get a trifle too much in our pockets.

We can do it by selling YALE Oiling Systems, which put a trifle too much oil on a Ford's bearings.

Instead of the regular magneto post, the YALE Accumulator Head is inserted. The bottom end is a lip or half-skirt, which collects oil thrown up by the magneto. There is no exposed spring to catch lint or strain out metallic particles which "short" the ignition. The half-skirt turns the oil into a copper tube that runs to the forward end of the crankcase—no drilling. That tube carries twice as much oil to the bearings as they get through the regular pipe.

The YALE Transmission Oiler slips under the transmission cover without an extra gasket. It has a lip projecting into the stream of oil around the flywheel. This lip catches oil which is distributed equally all over the transmission bands and drums clear back to the rear bearing. If you've ever driven a Ford you'll understand why chattering and wear must stop under this kind of treatment.

That's why more than 100,000 YALE Oiling Systems have paid dealers and jobbers good profits. Missionary men and advertising are spreading sales-opportunities all over your territory. Take advantage of them. Write now for terms.

Roland & Koch

411 S. Main St., Los Angeles, Cal. 2715 N. Broad St., Philadelphia, Pa.

YALE OILING
SYSTEM
for FORDS





Be a Drednaut Distributor

Millions of Fords in operation, and a million more each year—only one device, the Drednaut Equalizer, has all these selling advantages Ford owners want: 3—Does not clamp to the leaf spring; —Cushions jolts; —Snubs rebound; — Checks side-sway; —Adjusts to car weight. Surely here is just the market, the product, and the opportunity, the distributor is seeking. We want a limited number of distributors with ability, capital and aggressiveness. Place your own estimate on this unusual opportunity then write us for our liberal terms to distributors, who have non-competing lines or to men wishing to engage solely in this profitable business.

AUTO SPECIALTIES MFG. CO., 574 GRAVES STREET, ST. JOSEPH, MICHIGAN

Also a Canadian Factory at Windsor, Ontario

DEALERS—It is easy to sell Drednauts and sell more of them. We can place a few more dealers who will write us promptly upon their business stationery.

OREQUALIZETS FOR FORDS

SPECIAL OFFER

Money-back Guarantee



The Always-Busy OIL SALESMAN

Make a real business of selling oil and alcohol. You can build up a surprisingly large volume of selling with up-to-date equipment.

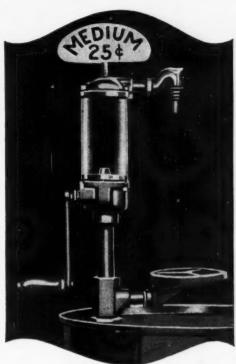
Other dealers are doing it. If we stated figures you wouldn't believe them. The best way is to experiment, and prove to yourself that we make no overstatement. You can do so without a cent of loss—on the contrary, with much extra profit.

HANDY BEN fits any oil drum. Just set him in and tighten the nuts. No extra equipment to buy. He makes any oil drum a quick-acting silent salesman. Well-made; he'll last your business lifetime. Try him out for thirty days, and see how much of his cost he has repaid in extra sales.

Clip the coupon now, and start him working for you immediately.

Bennett Injector Co.

Muskegon Mich.



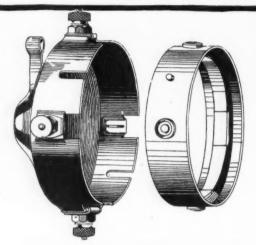
ONLY \$12.75

If you take advantage of this special offer

SIMPLY fill in the name of your oil or accessory jobber on this blank, and enclose your check or money order for \$12.75. Prompt shipment will be made. Your money refunded if you are dissatisfied for any reason in 30 days.

0 . 1	(II) * 1	Off	0
Special	Irial	Uller	Coupon

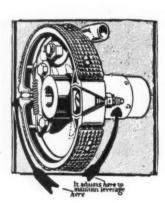
THE DUAL RUSh Timer FOR FORDS



1. Dual contact feature insures continuous and accurate firing . Timer Track will not burn rough or corrugate 3. Runs in cup grease - requires 4. All Rush products sold under a guarantee of satisfaction.



complete





Rush Piston Ring Extractor

This handy device will remove or replace on a piston all standard rings, either right or left cut, step cut or square cut. Eliminates all possibility of seriously injuring either the rings or pistons. A time and labor saver, Retail price \$1.50.

Exclusive Rush features that build sales for you!

Day in and day out, through years of hard usage, the Rush Timer Roller for Fords has proven its superiority. The dual contact feature of this famous Rush Roller preserves an unbroken rolling, wiping contact that prevents the timer track from corrugating or burning rough. It insures easy starting, and continuous, accurate firing at all times.

And Rush Timers require no oiling—they run in cup grease. These exclusive Rush features mean ready sales for you — and permanent satisfied customers. All Rush products are sold under a guarantee of complete satisfaction or money refunded. Timer Roller \$1.50. Timer Case \$1.50. Extra Replacement Ring \$1.00.

Rush Adjustable Emergency Brake Shoes FOR FORDS

Rush Adjustable Brake Shoes have proved their dependability to thousands of Ford owners all over the country-we have built into them all the braking power and wear resistance that the finest materials and scientific principles can give.

They are easily and quickly adjusted with a wrench without removing wheels—and the adjustment does not affect the brake leverage. The braking effect is the same on both wheels, positive in action and always dependable. By exposing the maximum of wearing surface, they will outwear several sets of ordinary brakes.

Retail price \$2.25 per set—Cast Iron; \$4.50 per set Asbestos Lined. (Licensed under original patents).

> Dealers: Order now for prompt delivery - from your Jobber

V. S. Rush & Co.

Mfrs. of Rush Transmission Band Oiler and Cooler

112 NO. DALY STREET

LOS ANGELES

S. S. McClelland Co.

Distributors East of Mississippi

1926 BROADWAY

NEW YORK CITY

Oil Ring with a



No matter what make of compression ring you install, be sure that you put on a Sav-Oil ring—you can guarantee your customers 1000 miles to the gallon of oil.

It is easy to handle a big Sav-Oil business—only a small stock is needed because only one ring is required per piston. Nor is it necessary to discontinue selling your favorite compression ring.

Sav-Oil rings *insure* proper lubrication and prevent oil pumping—the two bevelled surfaces pass over the oil on the up stroke of the piston, and the two right angled corners catch all excess on the down stroke and return same to oil reservoir. Years of actual service have proven their dependability.

Easily and quickly installed, they deliver consumer satisfaction and build good will for their distributors. The turnover is fast and the discounts are liberal.

Order now for prompt delivery.

Say-Oil

Rings are one piece, cast individually from the highest quality soft grey iron, carefully machined and each one inspected. They conform quickly to the cylinder walls and will not score them. "Sav-Oil" is stamped on the bottom of every ring.

\$100 List

up to 4" to 5" \$1.25

Territories Open for Distributors

The Sav-Oil Ring Mfg. Co.

1037 So. Figueroa St.

Los Angeles

Sav-Oil Ring Mfg. Co. 550 Golden Gate Ave. San Francisco, Cal.

C. H. Mountjoy & Co. 211 Third St. San Antonio, Texas

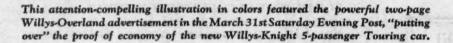
Sav-Oil Piston Ring Co. 2056 Jackson Blvd. Chicago, Illinois

H. W. Blevins 1532 Grand Ave. Kansas City, Mo.

WILLYS







HARD-HITTING advertising in big, commanding space is helping to pile up profits in the greatest money-making year Willys-Overland dealers have ever experienced. Public appreciation of Willys-Knight beauty, economy, and the marvelous sleeve-valve engine that improves with use, is manifest everywhere in the tremendous Willys-Knight buying wave.

OVERLAND



H. W. Lynch, of the Southern Motor Company, Goldsboro, N. C., a town of 11,296 population, writes:

"Every customer of ours that we have sold a Willys-Knight or an Overland is satisfied, and not only this, but they are not silent in their satisfaction, for they are voicing their satisfaction to make sales for us. We are in the automobile business to make money, so we took the Willys-Overland franchise."

W. E. Bissinger, of Muncie, Indiana, writes:

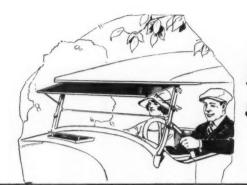
"From our point of view the Willys-Overland franchise is the most valuable in existence, due largely to the co-operative efforts put forth by both the dealer and Willys-Overland, Inc. We have made approximately \$6,000.00 net in a period of three months. We would not trade our franchise for any other in existence."

Willys-Overland dealers are today enjoying the greatest prosperity of their entire history. Never will a more favorable opportunity be presented to "get aboard" this live, winning combination—Overland and Willys-Knight. Communities of all sizes, from the smallest to the largest, are reporting phenomenal and steadily increasing sales of the new models.

No community is too small to afford a highly profitable dealership. Write for details and copy of the "Book of Evidence."

WILLYS-OVERLAND, INC., TOLEDO, OHIO Willys-Overland Ltd., Toronto, Ont.





Looks like a million dollars sells for \$3.50

and nets a nice profit

for a big summer visor business!

This Higgin all-metal Visor is just as appropriate for a fine car as it is for a car of low or medium price.

The car owner could pay three times as much and get a visor that would look not a whit better and work no better.

By making the Higgin of 22 gauge steel we've provided a visor that's just as durable as the rest of the car. It can't sag or become misshapen.

The bottom edge is curled over to form a water spout which throws water clear of the windshield. Then, too—using sturdy steel gives us a chance to bake on a really beautiful finish that will stay.

The Higgin is (hard baked) enameled—black on the outside—green inside.

The Higgin is adapted for use on most types of cars, open or closed, including Fords.

It takes only a few minutes to install the Higgin—the fittings are simple but thoroughly efficient and make possible its easy adjustment. It will not loosen or rattle.

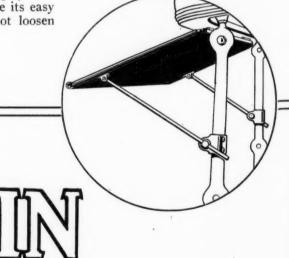
The visor idea is here to stay it only remains for you to handle a good visor—one which you know will deliver the service and on which you can make an honest profit.

This is the visor that fills the bill. For a big summer business—for a big "all year" business, sell the Higgin. Write today.

The Higgin Mfg. Company Automotive Division

Newport

Ky.



METAL VISOR

The Rollers in GILLIAM Tapered Roller Bearings form true rolling cone lines when in operation, and do not depend upon the cage to keep them in axial alignment. This is accomplished by the patented feature on the thrust rib of the cone.

There is a GILLIAM bearing for practically every application and location in all makes of cars.

> Axle manufacturers equipping with Gilliam Tapered Roller Bearings include: Adams, Salisbury, Columbia, Torbensen, Clark, Flint, U. S., Sheldon. Wisconsin, Vulcan, Standard Equipment.

Cups, Cones, Rollers ALLOY Steel



Gilliam service parts and bearing replacements are available at any of the following distributors:

of the following distributors:

Sub-distributors not listed.

AKRON, Ohlo, Ablberg Bearing Co., 369 S. High St.

ALBANY, N. Y., Fafair Bearing Co., 369 S. High St.

ALBANY, N. Y., Fafair Bearing Co., 369 S. High St.

ALBUQUERQUE, N. Mex., Hoover Motor Co., 416 W. Cooper Ave.

ATLANYA, Ga., Ablberg Bearing Co., 322 Ivy St.

BALTHINGRE, Md., Ablberg Bearing Co., 4170 N. Charles St.

BALTHINGRE, Md., Ablberg Bearing Co., 4170 N. Charles St.

BOSTON, Mass., Ablberg Bearing Co., 481 Lafayette Ave.

BROOKLYN, N. Y., Ablberg Bearing Co., 481 Lafayette Ave.

BROOKLYN, N. Y., Ablberg Bearing Co., 481 Lafayette Ave.

BUFFFALO, N. Y., Ablberg Bearing Co., 481 Lafayette Ave.

BUFFFALO, N. Y., Ablberg Bearing Co., 1030 Main St.

BUFFFALO, N. Y., Ablberg Bearing Co., 1030 Main St.

BUFFFALO, N. Y., Ablberg Bearing Co., 1030 Main St.

BUFFFALO, N. Y., Ablberg Bearing Co., 120 Main St.

BUFFFALO, N. Y., Ablberg Bearing Co., 120 Main St.

CHICAGO, III. Ablberg Bearing Co., 2715 Michigan Ave.

CHICAGO, III. Ablberg Bearing Co., 2716 Michigan Ave.

CHICAGO, Michigan Ave.

C Sub-distributors not listed.

THE GILLIAM MFG. CO., Canton, Ohio



Packed in Attractive Displays

Ohio Radiator Caps are packed 10 to a box in handsome two-color counter or window display containers - A SURE SALES STIMULATOR.



Bar Type For All Cars

This popular type of radiator cap is made either in aluminum or bronze nickelplated. For durability, strength and service it has no equal-not a die cast job, but has machine cut threads that fit the car accurately.

OHIO RADIATOR CAPS

Quality is so apparent in Ohio Radiator Caps, that it takes but one look to convince the motor car owner that he needs He WANTS one because they top off the radiator in just the right style—they're on and off in a jiffy, for they're made to fit with the finest of accuracy.



Diamond Type

This type of cap was designed for those car owners that desire just a little more snap-a more racy looking cap than the bar type. It is selling like hot cakes, for its equal cannot be found elsewhere at the same price.

THREE SURE SPRING WINNERS

FORD

Pure Cast Aluminum Retail Price

STAR

CHEVROLET

Pure **Bronze** Nickel-plated

ORDER FROM YOUR JOBBER TODAY

Over 3,000,000 radiator caps will be sold this year—so we advise that you place your order immediately to insure delivery in time for this extraordinary business.

If your jobber cannot supply you with genuine Ohio caps, write us direct, sending us his name.

The OHIO PATTERN WORKS & FOUNDRY CO.

2734 Spring Grove Ave.

Cincinnati, O.



If you see (P) they are (K)







Solid Bronze Backs

where bronze backs are used

100% Virgin Metal

10 Times Tested

in inspection

Clean, Solid Babbit

no Blow Holes

Machine Finished
both before and
after babbitting

Not Over

a Day Away

"That's Why I
Use Them!"

"BECAUSE I can get Milwaukee Bearings when I need 'em — and when I get 'em they're right!

"Sure, I'm a crank—proud of it! Do you wonder I'm particular about bearings? Listen! Every time the gas takes a poke at a piston it gives a 2000 pound smash.

"Bearings made like Milwaukee's are bound to be right. They stay put.

"I'm a nut about service, too. Dog-gone it, you can't blame a man for squawking when his car is tied up a week or so. I like to get 'em out of the way quick. And Milwaukee Bearings help me do it. That's why I use them!"

MILWAUKEE DIE CASTING CO., Milwaukee, Wis.



Write Today for this Bearing Guide

It's easy to order from this handy Milwaukee booklet giving car, truck and tractor list, with bearing stock numbers for each. May we send it to you, with the name of our nearest distributor?

MILWAUKEE



BEARINGS







The man who signals with his hand, starts a guessing contest,-and the results are sometimes costly and tragic. Traf-i-kop is Definite,—it tells what the Driver INTENDS to do. That's protection.



Signals Everybody

- ~ cars behind cars approachingpedestrianstraffic officers

Makes guessing unnecessary. Definitely indicates the driver's intentions, -- a vitally important feature in car driving for the benefit of all traffic.

Clear white arrows on left front and rear fenders, indicate a right or left turn. Stop signal operates from service brake. Signal arrows automatically illumined at night when indicating turn.

Complies with all State Laws

Public Opinion, plus State Laws, will put Traf-i-kop on thousands of cars this year. This natural desire for safety makes Traf-i-kop a necessity,—an accessory with wonderful possibilities.

Jobbers and Dealers

everywhere, this is your opportunity. Write for details and discounts-NOW!

The Motor Products Co.

Dept. 304, Norwalk, Ohio, U. S. A.

The Best in Top Materials



Pantasote WAR

The surface-coated material adopted many years ago by cars whose standards of equipment are determined by quality, rather than by cost. Pantasate is different from all other top materials, regardless of names and efforts to produce a similar appearance.

One of the reasons why Pantasate is superior to other surface-coated top materials is that its secret composition has never been duplicated—though years of experiments have produced many imitations.

Textasote ""

A textile material for tops of custom-made bodies and sport models, where something chic in appearance is preferred to the more conventional surface-coated material.

Textasote is a specially constructed fabric, the fibres of which are thoroughly impregnated with Pantasote gum. Textasote is not only smart looking, but is durable, water-proof, mildew-proof and absolutely impervious to the elements in any climate and at any temperature.







3

CLAIMS WE ARE PREPARED TO PROVE

- 1. Quality that cannot be bettered.
- 2. Service that cannot be improved.
- 3. Largest stocks of widest range.

TRINDL PISTON PINS

TRINDL Quality cannot be bettered, because from a quality view point it represents the acme of perfection.

Solid bar stock of S.A.E. specifications comprises the raw materials from which TRINDL Piston Pins are made. Machining, grinding, polishing—in fact every machine operation—is done on the latest type of production machinery, by workmen expert in this work. Each step of manufacture is checked and inspected. The heattreating process—one of the important steps in piston pin manufacture—is done under such perfect and scientific methods that nothing but superior results are possible

TRINDL final inspection is most rigid. When TRINDL Piston Pins leave our plant they are as perfect as it is possible to make pins. This is your protection—a guarantee of accuracy and a perfect product.

TRINDL SUPER WARP PROOF VALVES

The quality of TRINDL Super Warp Proof Valves, like in all TRINDL products, represents a distinct step forward in valve construction.

The two most common causes of valve trouble—friction and heat—are overcome in the use of special alloy steel in both heads and stems. The non-corrosive steel in the heads withstands the highest heat successfully; the steel in the stems is proof against the hardest wear. Triadl Super Warp Proof Valves are made by a patented process, combining the advantages of other types while eliminating all the disadvantages found in them.

TRINDL Super Warp Proof Valves are manufactured from raw stock to finished product in our own shops. The regular TRINDL routine and careful supervision governs their progress from one stage to another. Therefore we can guarantee them as superior in every detail.

TRINDL SERVICE

TRINDL Service is a byword in a majority of shops, because it means prompt shipment when your order is received. Standard and oversize pins and valves are shipped immediately upon receipt of order. Specials leave our shop within 24 hours. No delay on hurry up or special jobs in your shop—we realize the importance of speed. Our stock includes pins and valves of every size—for every motor—ready for shipment on a moment's notice.

TRINDL Quality and TRINDL Service Never Fail

THE TRINDL CO.

2917 Wabash Avenue

Chicago, Ill.

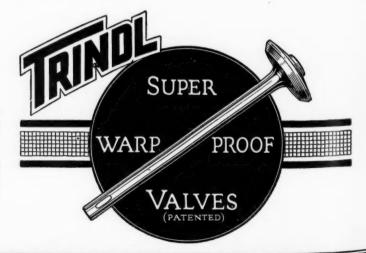
Milwaukee Branch: 615 Wells Street

Have You These Books?

You Need Them

Send for the book mentioned above, and ask for the other two—one is a straight stock and size list with specifications of all piston pins made. The other is the Trindl Super Warp Proof Valve list.

These valves, by the way, are making shopmen open their eyes. They are of a special alloy, made by a special process and stand up much longer than others that cost more. Ask us for full information on them.





A Real Foot Throttle for the Medium Price Trade

An article that has back of it the basic mechanical principles and perfection of design that have made the regular Williams Accelerator the recognized leader.

The Williams Junior Accelerator requires only two connections and can be installed in a few minutes. It operates efficiently and easily with direct action on the carburetor.

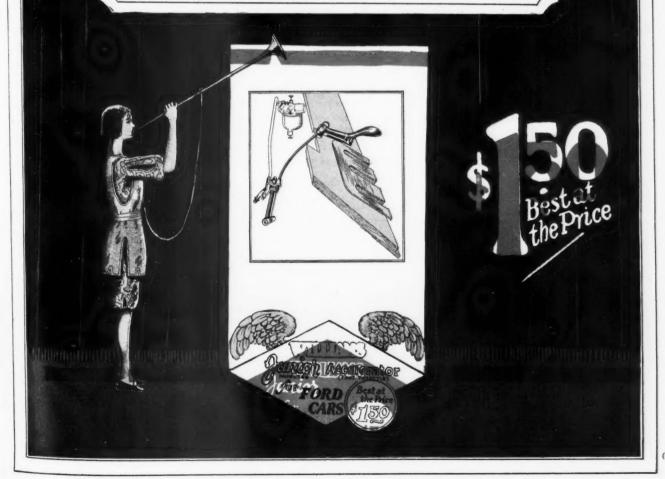
It is packed in an attractive, two colored carton, is being advertised in national mediums and will move fast because it has no equal at the price.

Order from your jobber immediately, you will find it a profitable item.

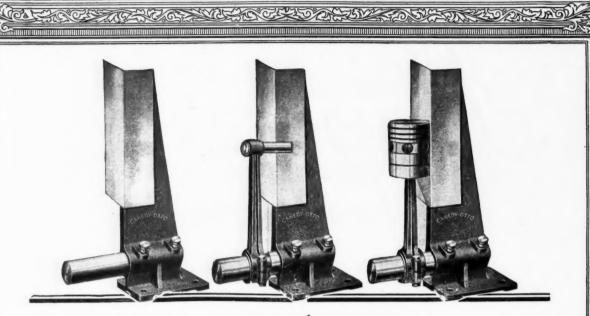
Anticipate the heavy dealer demand by ordering at once. Advertising literature now available.

WILLIAMS BROS. AIRCRAFT CORP.

SAN FRANCISCO, CALIF.



1



C-O Universal Alignérs quickly check fit of reciprocating parts.



C-O No. 0 Cranes cover widest range of work, reaching to center of any car or truck, yet they are readily portable. Light, steel frame and low, heavy base, passing underneath all axles, give excellent balance. Turns in its own width. Front casters lock crane when standing.

CANEDXOTTO

"The Well-Equipped Shop Gets the Business"

Even the best mechanic is helpless without tools. The better his tools, the better and faster he is capable of working.

With C-O equipment, every mechanic is encouraged to do his best. He gets results that stir his pride, stimulating him to still further improvement.

In heightened shop morals alone, assuring good work, and eliminating complaints, C-O equipment is worth every penny that it costs. Yet this is but a portion of the total benefit.

Increased output with proportionately decreased labor cost, reduced overhead resulting from more efficient use of floor space—these earn substantial profits.

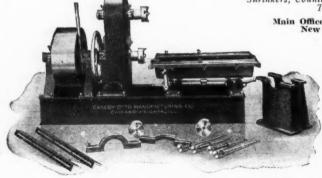
To build a healthy, steadily growing business, insuring present and future profits, install C-O equipment. Our big catalog is yours for the asking.

Address Dept. A

CANEDY-OTTO MFG. CO.

Manufacturers of Automotive Equipment, Drills, Punches, Shears, Shrinkers, Countershafts, Grinders, Buffers, Forges, Blowers, Tuyere Irons and Blast Gates

Main Office and Factory—Chicago Heights, Ill. New York Branch—407 Broome St.



Perfect work at lowest cost is guaranteed by the exclusive, practical advantages of the C-O Universal Burning-In Machine. Exact alignment of engine crankshaft and driving spindle is made certain by single control of table. Upper spindle places bearings in full view during burning-in operation. Sump in table, acting as lower half of crank case, assures adequate oil supply during running-in operation. Convenient attachments enable running-in engines under their own power. Many other exclusive features.





More Asbestos Means Bigger Sales—Better Profits

THE greater amount of asbestos in Garco means a greater amount of service for the owner. The solid-weave gives longer wear. These are the features which create business and repeat orders. GARCO is all brake lining. Substantial, sturdy, strong. Built in the great plant illustrated above, by the largest manufacturers of asbestos textiles in America. Nationally advertised. Always in demand by those who seek Quality.

GENERAL ASBESTOS & RUBBER COMPANY

Main Offices and Factories: CHARLESTON, S. C.

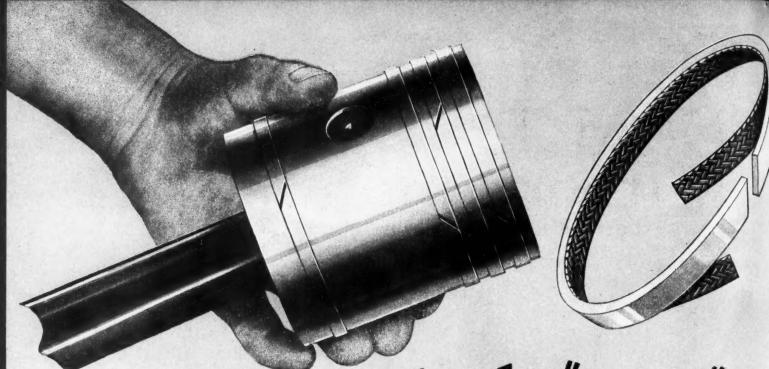
New York: 296 Broadway Chicago: 14 North Franklin St. Pittsburgh: 311 Water St.

Canadian Distributors:
Canadian Asbestos Company, Montreal

This handsome window display is one of our many dealer helps.







Take the "SLAP" out of the piston with

RINGPAK

REG. U.S. PAT. OFF.

MOST motor troubles originate from leakage of gas around and under the rings into the crank case where it dilutes the oil. See illustration above. Gasoline will not pass a piston sealed with RINGPAK. The

shaded portion of illustration shows how effectively RINGPAK packs the groove, taking up the clearance.

in strips contained in cans, each strip sufficient to pack one groove. 1 Doz. cans in handsome display container.

Can of 12 strips, $\frac{3}{16}''$... \$4.00 Can of 18 strips, $\frac{3}{16}''$... 6.00 Can of 12 strips, $\frac{1}{4}''$

(For Ford)..... 4.00

Special sizes and packages for wider or narrower rings and pistons of larger diameter. RINGPAK (Patent applied for) will take the slap out of the piston and the rings. It stops oil-pumping, thinning of gas and quickly puts new life and pep in any engine by increasing power and speed. It corrects faulty compression and minimizes carbon troubles. RINGPAK is a lubricated asbestos textile substantially reinforced. It holds the ring against the cylinder wall making a perfect piston seal. All excessive clearance is taken up by RINGPAK. Realize what this means in developing engine efficiency. Get RINGPAK. Sell it too. Install it. Here is a very profitable business builder which gives utmost satisfaction.

FREE SETS TO SERVICEMEN

To prove the merits of RINGPAK we will furnish without charge, a set of RINGPAK for a Ford engine and instructions for installing, to the first hundred servicemen answering this advertisement.



Dead True Mirror Smooth

—that is the accuracy and finish now made possible on cylinders with the

Red Devil Self-Aligning Burnishing Machine Refit New Pistons At a Profit

without removing engine from car

It is now possible to fit new oversized pistons to cylinders without removing the engine from the car when the variations do not exceed five one-thousandths of an inch.

Cylinders slightly tapered, — out-ofround,—or with shoulders worn by pistons or rings may be made ROUND,
STRAIGHT, AND TRUE WITH
THE RED DEVIL SELF-ALIGNING BURNISHING MACHINE
AND COMPOUND. Use after reboring to remove tool marks and to polish
the cylinder wall—it will prolong the
life of pistons and rings—ALSO use
after regrinding cylinders to remove
wheel marks and burnish off high spots
left in the cylinders.

THE RED DEVIL SELF-ALIGNING BURNISHING MACHINE is equipped with a RED DEVIL universal joint and designed for operation with a one-half inch portable electric drill. A suspension spring is furnished with each machine, permitting overhead suspension of the drill and burnisher that relieves the operator of any possible back strain.

THE RED DEVIL BURNISHING MACHINE is built in two sizes and is for use ONLY with the RED DEVIL BURNISHING COMPOUND.

No. 1 fits all cylinder bores, 2 13/16 to 31/4.

No. 2 fits all cylinder bores, 3½ to 4½.

at all Leading Jobbers

Made by the makers of the world famous
RED DEVIL Dolly Jack

MID-WEST MANUFACTURING CO.
MINNEAPOLIS, U. S. A.

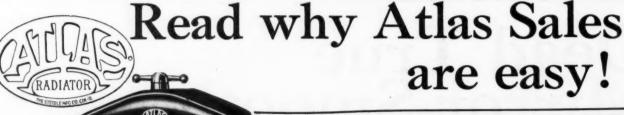


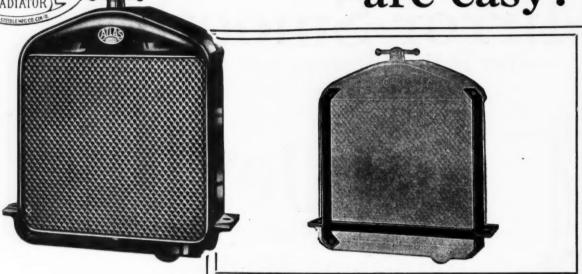
THE RED DEVIL BURNISHING COMPOUND is used in conjunction with the RED DEVIL BURNISHING MACHINE. The Compound is scientifically developed and is positively guaranteed to contain no abrasives such as emery, carborundum, ground glass or any oher substance that will in any way injure the cylinders, as do the abrasives above enumerated, by leaving a harmful deposit in the pores of the cylinder wall that come to the surface after the engine is assembled and effect continual harmful abrasive wear on piston ring and cylinders.











THE ATLAS RADIATOR IS BUILT STRONGER than any other replacement Radiator on the market. A heavy steel bar across its rear face, which is integral with the bracket supports and the radiator sides, not only makes the radiator immune to side strains and jolts but adds a further brace to the frame as well.

A stronger radiator—it is also a more efficient one.

Its flattened tube construction gives it three times the water capacity of the tubular type and four times the cooling surface.

Because its brass honeycomb is flexible and expands when the water freezes, the Atlas will not burst in winter.

And because of its increased cooling area—neither will it overheat in summer.

ATLAS sales are easy because no Ford owner can get away from the structural superiority of this replacement Radiator.

Point out its advantages and when the time comes for a replacement they will come to you for an Atlas.

The Atlas is the all year Radiator. No overheating in summer and no bursting in winter—and its built to stand up and give perfect service even under the most destructive abuse.

Sell the Atlas and tell your patrons about it. Every sale means a real profit — the discounts are liberal. Write for further details.

SPECIAL NOTICE

Dealers who are installing new radiators for Ford cars will appreciate the added radiation or cooling qualities of the Atlas, as well as its interchangeability.

The Atlas is designed to fit the present Ford shell, yet increase radiation to a greater degree than any other radiator on the market.

Use of the old shell saves your customer money — the installation of the Atlas guarantees PLUS efficiency.

FOR FORDS

Steidle Manufacturing Company
Cincinnati, Ohio

ATLAS RADIATORS

"The Radiator with a Backbone"

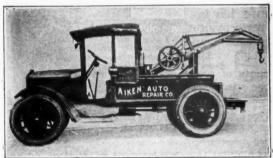
MANLEY CRANES ARE ALL OVER THE COUNTRY



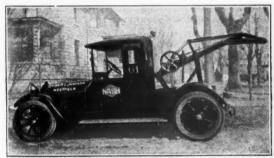
IN PHILADELPHIA, PA.



IN LOUISVILLE, KY.



IN EAST ST. LOUIS, ILL.



IN WESTFIELD, N. Y.



Another splendid advantage is that it can almost instantly be converted into a portable floor crane for use inside the shop.

AND--in 5000 other well equipped shops all over the country.



Manley

Wrecking Cranes are in daily use by 5000 garages

THERE must be a real reason for this condition—

There is — Manley Wrecking Cranes have been found to do the work better, quicker and more economically, because they have the necessary features a Crane for this service must have. These features are patented and are therefore exclusive to the Manley Crane.

Words don't necessarily mean anything —it's "What can you do?"

Manley Wrecking Cranes wouldn't be selected by so many intelligent Garages and Service Stations unless they "delivered the goods" as claimed.

Get a Manley Wrecking Crane—give your customers better, quicker service—give them the best service—build up a big volume of repair business—with your Manley Crane because it brings this business to you. After this watch your profits grow.

Write today—now. Send for Manley's complete Crane Catalog and other labor saving shop equipment. All the leading Jobbers sell it—ask yours.

MANLEY MFG. CO., York, Pa.

Any Shop With

Manley Garage Equipment

Is the Best Equipped Shop, It Gets the Business

The Market for Cars Around \$1000 Is More than Ever Turning to "Fours"

The New Lycoming Motors, Better Fours, Are Adding Impetus to This Trend

THE man with about \$1000 to invest is typical of the average automobile owner who personally looks after his own car.

For this average owner, the simplicity, as well as the economy of the engine are of major importance. He expects to make all minor adjustments or repairs himself. He counts upon low gasoline consumption, high tire mileage, ample and flexible power, economy in operation; and in the car itself, all the comforts and refinements that will contribute to ease of travel and pride of ownership.

And now this same man with a comparatively limited amount of money to invest is beginning also to expect a *closed* car even in the lower price ranges. This is still further broadening the possibilities of the "four" to the car builder who finds it difficult to meet this big popular demand with cars built around larger motors of more cylinders and attendant higher total car costs.

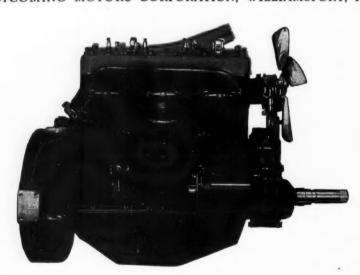
This is particularly true with engines like the new LYCOMING FIVE-BEARING FOURS which have the power flexibility and vibrationless performance generally expected only from engines of more cylinders.

In the last five years the use of LYCOMING FOURS has increased tenfold. This is evidence of the satisfactory performance of these engines, of which nearly 200,000 have been bought by car-makers.

The new LYCOMING FOURS embody improvements of real importance. These will be evident from a study of the specifications, which are well worth writing for.

Are you reading the Lycoming pages in The Saturday Evening Post? The next one appears April 28

LYCOMING MOTORS CORPORATION, WILLIAMSPORT, PA





The Purpose of the RED HEAD

The red head on all new Lycoming "Fours" is used irrespective of size or specifications. Therefore, when seen in either passenger cars or trucks, it may be on any of four different models, solely for the purpose of indicating them as motors made by Lycoming.

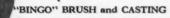
The New LYCOMING Motors





The "all-metal track" and contact points are of brass, imbedded in the molded Bakelite distributing head and extending 1/16-inch beyond its surface. The "raised-track" construction insures long life.

The air-gaps that separate the "all-metal track" from the contact points are something NEW in timer construction. Their purpose is to allow the brush a clean "make and break"—the same method used on armatures for years.



The brush is of a graphite and copper composition—and therefore self-lubricating. The rotor is diecast which insures accurate timing.

"BINGO" DISTRIBUTING HEAD

—of molded Bakelite and therefore waterproof—also fool-proof against "grounds" and "short-circuits".

"BINGO" TIME HOUSING

The ring holding the distributing head in position is of solid brass, nickel-plated.

Your INITIAL ORDER AT MANUFACTURING COST—that's our proposition to you, Mr. Dealer. We need YOU—your selling talks to your customers—to put the "BINGO" over in a big way.

That's why we are offering you this extraordinary opportunity—we want to pay you well in RICH PROFITS for your time and trouble.

Our display cards and other dealer helps will assist you-bring customers into your store to buy.

Once sold the "BINGO" stays sold and repeat orders will come. For the "BINGO" is an accurate timer—waterproof, fool-proof and unqualifiedly guaranteed.

On a recent blocktest, the "BINGO" timer was run 3500 miles continuously. The micrometer showed practically no wear on the track and only 3-1000 of an inch on the brush. Give your customers such a timer and they'll come back for more.

Fill out the Coupon TODAY. Make a REAL PROFIT on your timer sales.

The Wm. Deddens Manufacturing Co.

35 East Front Street, Cincinnati, Ohio

IMER RY TIME

"The Tire With Yors

Order a few DENMAN-MYERS Cords

0

Sell them to customers who will place them in service opposite tires of any other make

a

Watch their performance

a

You will then ask for our exclusive franchise



The Denman-Myers Cord Tire Company
Factories and General Offices

Warren

Ohio

" For Car Owners Who"
Discriminate





The danger from bad weather driving has become ancient

Here is one of the best selling items in the line of Automotive Equipment. Not a luxury but an actual necessity. The cheapest accident insurance obtainable. Designed by Automotive Engineers and built by Electrical Specialists. Two years spent in its development. Thousands in service. Will operate at regular speed regardless of the speed of the motor. Rugged, Silent, Economical and Efficient. Is furnished with or with-

out mirror. Weighs less than two pounds and requires less than four amperes to operate. A suitable fitment for Rolls-Royce or Ford. Guaranteed to fit, to serve and to satisfy

We Berkshire Electric Windshield Wiper is being advertised broadly in twelve national and trade publications. Place your order with your Jobber today and participate in the excellent profits being earned through the sale of this device.

BERKSHIRE - J&B TIMER For the FORD CAR or TRUCK



We Old Reliable J & B Timer. A standard for years. Known to the discriminating Ford-owner and the progressive Dealer as being long-lived, dependable and efficient. It is built by Ignition specialists and is designed to synchronize with the motor in the Ford Car, Truck or Tractor. Rugged and fool-proof—nothing tricky or mysterious about the design or construction. Guaranteed to fit, to serve

and to satisfy. That Dealer who is looking for reasonable profit and at the same time is desirous of satisfying his Ford customers should stock and sell J & B Timers. Distributed by all responsible lobbers and sold by nearly 25,000 Dealers.

The Lowest-Priced High-Grade Timer Built Retails for \$1.50

SUPER-COIL Replacements

And now every Dealer can make Coil Replacements. The Berkshire Super-Coil is interchangeable with every make of battery ignition coil. With its detachable resistance elements and condenser and

three simple bases any car can be fitted by the most inexperienced mechanic. No necessity for tying up a lot of capital in slowly moving stock—an investment of less than \$8.00 puts you in position to make any coil replacement on any car using battery ignition. The pro-



SUBSER-COU UNIT

duct of nearly a quarter of a century experience in the manufacture of ignition devices. Guaranteed to fit, to serve and to satisfy. Stop sending this highly profitable business away from your door—you can handle it with the Berkshire Super-Coil.

Get a UNIVERSALLY INTERCHANGEABLE Service Station Set from your Jobber

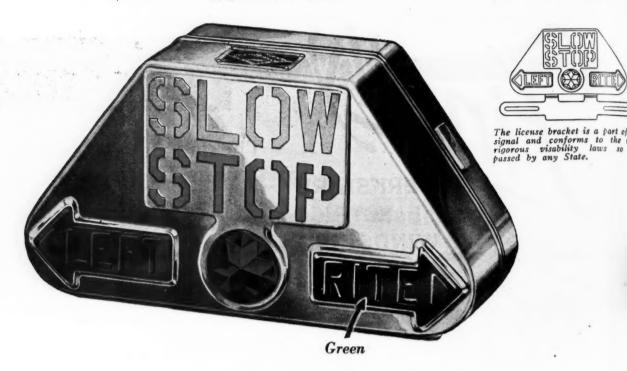
Manufactured by

BERKSHIRE PRODUCTS CORPORATION

"Successors to - J&B Manufacturing Co. Berkshire Magneto Co. "Automotive Equipment Manufacturers tor Almost a Quarter Century."

PITTSFIELD, MASSACHUSETTS U.S.A.





An Automatic Signal That Warns of Every Move

THE widespread adoption of the familiar "Stop" light shows how the public has come to recognize the need for an automatic method of signalling

method of signalling.
But the lone word "Stop" leaves a lot untold.
What is he "stopping" for? To pull up at the curb? To turn left? To turn right? Or sim-

ply to slow up?
The Diamond Automatic Automobile Safety Signal is the answer to a long expressed demand. It tells the *complete* story to those behind, with no effort or thought on the part of the driver. He presses no buttons or pulls no levers—he simply drives as usual, and the Diamond automatically announces his intentions

The Diamond Safety Signal is fool-proof, and unfailing in operaton. By an ingenious "plug connector" system, each of the five feed wires is compelled to select its proper circuit and

operate the proper signal. It can't cross another wire or flash the wrong signal. A slight pressure on the brake pedal closes a switch that lights the word "Slow." A heavier pressure lights the word "Stop." A slight turn of the front wheels in either direction closes the switch to "Left" or "Right" according to the direction. Tail lamp and license bracket are incorporated in the device.

The Signal housing is of rust-proof pressed metal and is everlastingly durable. All the lenses are made of duPont unbreakable translucent material. It is beautifully finished in standard heavy, lustrous non-break enamel. The "Special" model is richly nickeled.

Installation in the back of the car or on the rear left mud guard is a quick and simple operation. And anyone familiar with the electric equipment of motor cars can make the wiring connections with ease.

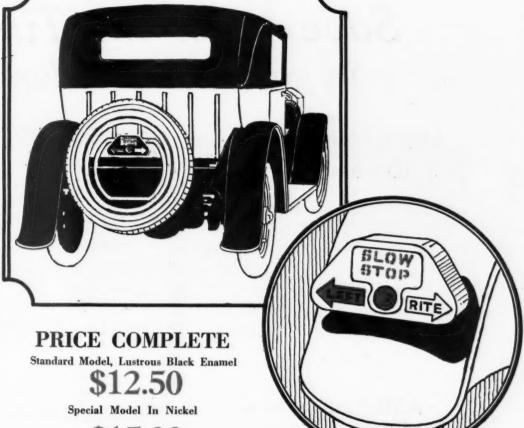
The



AUTOMOBIL

An ingenious plug connector selects its proper circuit and prevents any possibility of crossed wires or wrong signals.





The Diamond Opens New Trade Opportunities

Conforms to Massachusetts Law and has been approved by that Commonwealth

The Diamond Safety Signal is a product of mature engineering study, and embraces every feature of design and construction to make it commercially useful and to assure it a place among the really permanent merchandising successes of the industry.

In bringing to motoring a measure of safety never before enjoyed—never before possible—it comes to a market already waiting and expectant.

A distributing proposition of unusual interest awaits your inquiry.

AUTOMOTIVE DISTRIBUTING CORPORATION

International distributors and manufacturers of automobile necessities and safety appliances

703 FINANCE BUILDING

PHILADELPHIA



TRADE MARK

SAFETY SIGNAL

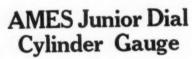
Save %10 of the Time in gauging cylinders

AMES Universal Attachment

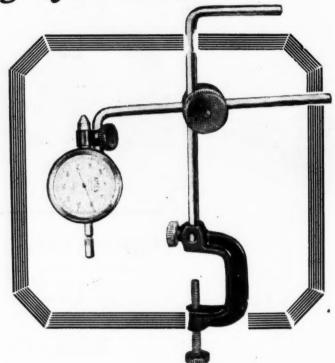
uses same Gauge as supplied with Junior Dial Cylinder Gauge. Tests for straightness of shafts, flatness, thickness, roundness, heights, etc.

Price with Gauge \$5.00

Price with Gauge 15.00



"Thousands Already in Use"



Tests for Cylinder Wear, Taper, Out-of-Roundness. Size instantly shown in thousandths of an inch on dial face. Price \$17.50.



Push the AMES Junior into a cylinder, and pointer on dial face will show amount of taper instantly. Revolve the Junior in cylinder, and amount of out-of-roundness is shown.

Gauge measures between top and bottom contact points through cylinder axis. Mounting centers Gauge in cylinder.

Hand contains contact points for all sizes from 25% inch to 5 inch. No skill required to operate the Gauge, and it always registers the same.



B. C. AMES CO.

Waltham, Mass.





Low Cost—Comfortable Motoring

This Buick four cylinder, five passenger touring car affords dependable, comfortable motoring for every occasion.

Improvements in the design of both the chassis and the famous Buick Valve-in-Head engine have contributed further to the well known Buick qualities of dependability and economy. Innovations in equipment have provided comforts in the open model that approximate those found in much more expensive closed cars.

For instance, with the Buick designed storm curtains, reinforced by the Buick weather strip, closed car coziness in bad weather has ! closely approximated. A signal driver, complete instrumer sion lock and mar features ever

Fours

Fleet Sales are not Unusual for Buick

Due to the continually increasing use of Buick cars by business firms, sales of several Buicks at one time frequently add to the profits of Buick dealers. Why not have your name on file?

MOTOR COMPANY, FLINT, MICHIGAN Division of General Motors Corporation

Pioneer Builders of Valve-in-Head Motor Cars



Branches in All Principal Cities

There is no such thing as conducting business without spending money. But there IS such a thing as spending it profitably.

The price of a Franklin Air and Water Station buys permanent advertising of a highly effective kind-at a cost no greater than printing and mailing a thousand circular letters ONE TIME.

For it sells, complete, for only \$58.50.

The Kind Of Service That Wins Customers

With its long overhead hose that will reach all the tires on two cars at the curb without moving either car, the Franklin Air and Water Station is a time-andlabor-saving convenience that car owners are quick to appreciate. Just a gentle pull brings it to any wheel, and when your hold is released the perfectly balanced coun-

terweight draws it back, out of the way. The water flow is controlled by a push button at a convenient height on the post

-and the motorist can fill his own radiator in less time than you would take to fetch and fill a bucket. Just to see the Franklin on the curb is to make car owners feel that HERE'S a house that believes in real service.

Will Last A Lifetime

Except for the hose, there is nothing to wear out on the Franklin. No mechanism to get out of order. No springs to rust or break or lose their tension.

Everything is included in the purchase price-generous length of highest grade air hose with coiled wire guard, automatic chuck, nonkinking water hose with handy, quick-acting Lunkenheimer valve, two-way lettered ground glass globe that is visible for two blocks, and electric wiring for globe light.

JOBBERS: The great utility and low price of the Franklin Air and

> Water Station make it a quick and profitable seller. Write for electrotypes, counter literature and other sales helps.

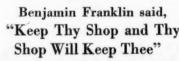
COMPLETE

FRANKLIN AIR COMPRESSOR WORKS

Manufacturers of Franklin Air Compressors Norristown, Penna.



Benjamin Franklin said, "Keep Thy Shop and Thy Shop Will Keep Thee"





"THE BEST EQUIPPED SHOP GETS THE BUSINESS"

You'll Get Sure Results-

by measuring the correct oversize of a cylinder with

Stevens

MicroGauge

T.105 Stevens Micro-Gauge, with 10 fard pins to measure 3 to 4", in box, list \$5.00

T.500 Stevens Micro-Gauge, with 1 fard pin, list \$5.00

T.503 Estra Fixed Pinz, each, list \$5.00

Y OU need a REAL precision instrument to determine the correct oversizes when fitting rings and pistons.

Makeshifts are only guesswork and cause a lot of worry and trouble for you.

With Stevens MicroGauge any mechanic in your shop gets precision results quickly. It's so simple to apply—the opening between the fixed pin and adjustable pin gives the exact oversize which is accurately measured with a thickness gauge.

With STEVENS MICROGAUGE SET T-504, including ten fixed pins, you are assured of complete accuracy in all your work—you know EXACTLY what you are doing.

List price of set \$5.00—and that small investment will stop your loss from guesswork. Order yours today for the spring business and write us for discount.

95 Special Tools-Send for Catalog

The 95 Stevens Speed-Up Tools are designed to give you greater speed and accuracy—MORE PROFIT—because each fits its job perfectly. Ask for Catalog 105-MA.

Stevens & Company

375 Broadway

New York

95 Special Tools-

Each Fits a Job

Stevens Speed Tools

ATWATER KENT

SERVICE



COVERS THE CONTINENT

THERE are over 500 carefully selected ATWATER KENT Official Repair Stations, conveniently located, throughout the United States and Canada.

Look for this Sign



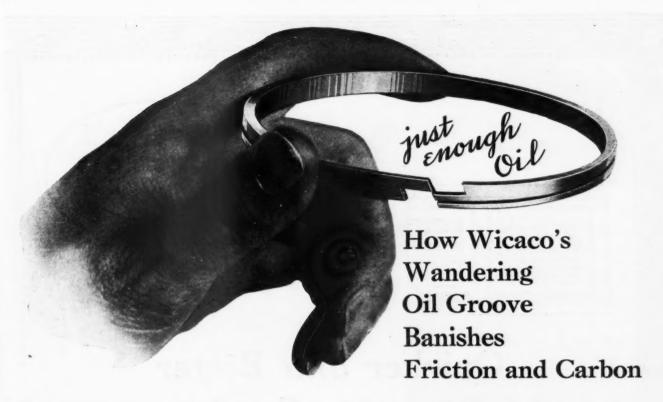
The Sign of Efficient Service

All are dependable and competent to render efficient service—they must come up to ATWATER KENT standards.

Service is only one of the outstanding features which makes ATWATER KENT Ignition, Starting and Lighting the highest grade in the world—accuracy in design and construction are others.

ATWATER KENT spares neither effort nor expense to provide the best that can be had.

ATWATER KENT MANUFACTURING COMPANY, PHILADELPHIA, PA. 4957 STENTON AVE.



OIL grooves are of two kinds—the straight cut and the Wandering Oil Groove.

The latter kind is the distinguishing feature of the Wicaco Piston Ring. There is no other like it. It's patented.

Oil coursing up and down its sides gets to heretofore unreached high spots on the cylinder wall. It lessens the natural friction between the piston ring and the cylinder wall. It catches this metal thief at the very start.

Simultaneously, it starves the other enemy—carbon. Its scraping edge returns all excess oil to the crankcase. Carbon cannot clog the combustion chamber—and oil consumption is lessened.

The ring cannot be clogged. Lubrication cannot be stopped. Friction cannot hold sway.

The Twin Cut itself, combining as it does the old step and diagonal cuts, provides a most effectual control of the compression charge.

You should be sufficiently interested in the other features of the Wicaco Piston Ring—its one-piece construction, its concentric shape and its individual cast—to get the full story from us or from your jobber.

The details will be sent-on request.

WICACO SCREW & MACHINE WORKS, Inc. 4801 Stenton Ave. Philadelphia, Pa.

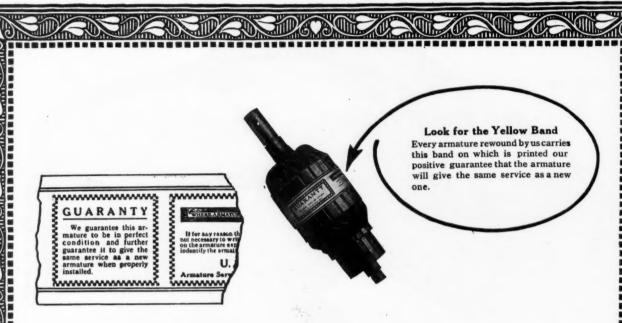
A Special Jobbers' Zone Distribution Plan

Jobbers: To give dealers, repair shops, and garages live distributing service we have developed a Jobbers' Zone Distribution Plan that will prove especially interesting to the first jobbers selected for each territory. It will be well worth your while to learn the details.

50c and up



WICK-A-CO



Quicker and Better Armature Service

Our armature service has grown to such an extent during the past few years that it now occupies a separate division of our business. The volume of work handled has repeatedly doubled and redoubled until today our stocks of rewound armatures reach well up into the thousands.

Prompt service, accurate and guaranteed work, and the lowest prices consistent with quality have been the reasons for this remarkable growth. During 1923 we will do our level best not only to maintain our excellent service but to improve upon it if at all possible.

To those not familiar with our high type of service we suggest a trial order. Send us defective armatures for any make of car and rewound ones, guaranteed to give the same service as new ones, will be shipped from our exchange stocks the same day the order is received. Thousands of dealers and repairmen are now on our list of steady, satisfied customers.

Send in the defective armatures you have or write for a complete price list.

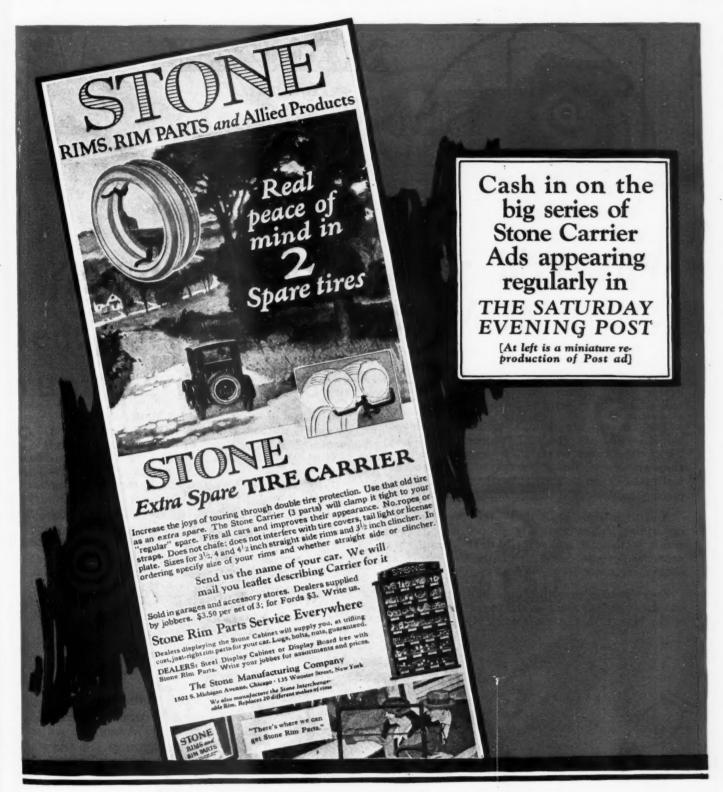
U. S. AUTO SUPPLY COMPANY

ARMATURE SERVICE DIVISION

3845 S. Wabash Ave.

Chicago





TONE among the "First 20!" Because Stone Products are known, needed and demanded, leading jobbers now include them with the first 20 leading products for sales concentration.

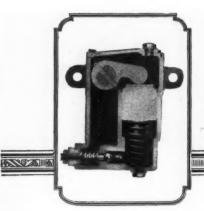
So you can build a big trade on the Stone Extra Spare Tire Carrier. Car owners are strong for it. It fills a real

need. Each sale helps you to sell a rim and tire. Retails \$3.50; Ford size, \$3. Signs free. Ask your jobber.

Every car-owner should carry extra Stone Rim Parts. The Stone Steel Cabinet or Display Board is a real salesman for you. FREE with orders for Rim Parts. Ask your jobber for assortments and prices.

The Stone Manufacturing Company 1502 South Michigan Ave., Chicago 135 Wooster Street, New York

We also make Stone Interchangeable Rims, Stone Shock Absorbers and maintain complete service on all makes of rims and wheels



MANZIEL Hydraulic Shock Absorbers

Why You Should Join the Ranks of Manzel Dealers

Dealers everywhere who sell "Manzel" Hydraulic Shock Absorbers are making good profits and a long list of satisfied customers.

The reasons are many. Unlike the conventional type of rebound absorbers, "Manzel" Shock Absorbers retain their original efficiency throughout the life of the car with no mechanical break-down or wear from the ceaseless hammering on the car springs.

. And they bring an entirely new conception of car riding. Automatically proportioning their action to the size and severity of the bump, they ease the springs down so gently that the road shocks are never felt.

Every road is smoothed out—and all this without the slightest effect on the operating efficiency of the Manzel, because the work is done by automatically controlled OIL, and not by springs and straps.

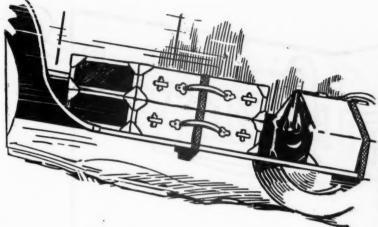
Because of their simple design, rugged construction and automatic oil control, they will last as long as the car without any attention whatever.

The "Manzel" sells for less money than any other high grade reducing instrument, gives the greatest satisfaction and is easily and quickly installed.

We have an interesting proposition for dealers and distributors. Write today for full particulars.

MANZEL BROTHERS COMPANY 306 Babcock Street, Buffalo, N. Y.





Displacing the fence on the running board

P OR a luggage carrier, motorists don't want an eye-sore—that's certain. Neither do they want to fence off the whole running board everytime they take on a bit of luggage. And what's more, they don't want the baggage to loosen or to scrape the finish off the car—or to rattle about with every jolt.

What they want in a carrier is one that will hold any kind of luggage—that's simple to operate—compact—out of the way when not in use—and (not to be overlooked) inexpensive.

The Hykon Luggage Carrier has all these practical features and should therefore appeal to motorists everywhere.

It's place is under the running board entirely unobstructive when not in use.

To operate—it's only necessary to take hold of the metal end of the tape, pull it over the luggage and fasten on the hooks conveniently placed on the inside of the running board. A simple turn of the wing lock tightens the strap and locks it fast.

To unloosen merely reverse the operation. The webbing turns back into the winding.

The carrier is substantially made to stand up under severe weather and under long service.

Only one size to carry—and that will fit every car from Ford to a Pierce-Arrow.

Put this money maker in your accessory department now.

THE HYKON MANUFACTURING CO., ALLIANCE, OHIO





List Price

\$150



Fill in and mail to your Jobber:

G	en	t1	em	en	0

Please furnish us with.......dozen HYKON LUGGAGE CARRIERS as advertised in MOTOR AGE, April 5th. Bill us at \$18.00 per dozen less our regular discount.

Name

Addres



"Where Are You At?"

A very low freight charge will service jobbers and their customers throughout the East from Easton and Philadelphia, Pa.

A lower water rate will service the Atlantic and Gulf coast states.

An extremely low water rate will service the Pacific coast states and British Columbia (only 21 days required).

From a stock of 190,000 springs at *Richmond*, *Ind*., all of the central states can be quickly and cheaply serviced.

A HALF CENT USELESS FREIGHT CHARGE ADDS A HALF CENT TO THE PRICE.

If you do not know Butler quality write us or ask your neighbor. If you have used Butler axles, nuts, keys or keystock, you know Butler quality.

BUTLER AUTOMOTIVE STEEL CO.

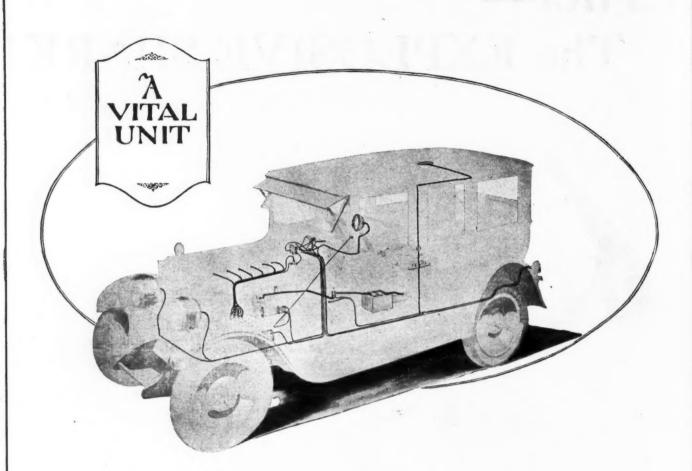
101 D STREET EASTON, PA.

BUTLER
REPLACEMENT-SPRINGS

A Fact— The EXPLOSIVE SPARK!



Operates on a leaner mixture



The Nerve System

The cable system is one of those units which are absolutely essential to the operation of every automotive vehicle.

No car has been properly serviced until all defective cable has been replaced and all terminals and other connections made secure.

"We inspected all electrical connections and replaced all defective wires with Packard Cable" gives the impression of a thorough, reliable servicing job.

Have you a Packard Wiring Chart? It shows the style of cable to be used for every purpose on all makes of cars and trucks.



WARREN

OHIC

Modul

Engine Bearings and Bearing Alloys

RALPH DE PALMA 1000 SOUTH HOPE STREET Los ANGELES

Mr. David W. Rodger, Detroit, Mich.

Dear Mr. Rodger:

Many thanks for answering my last letter.

I received a shipment of fine looking connecting rods the other day.

I am glad that you are responsible for the bearing job.



Where will you find a man who has had a better opportunity for comparing motor car parts and materials under the most difficult conditions of service than Ralph DePalma?

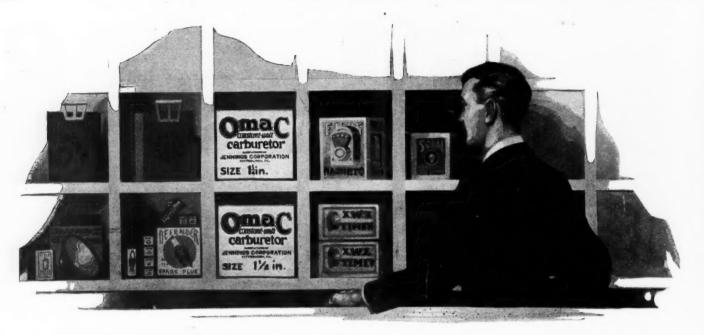
His brief commendation of Mogul Bearing Metal is high praise indeed.

DePalma's opinion coincides with those of a large majority of this country's famous engineers and racing drivers. For "Mogul Alloy Genuine" special bearing metal possesses a combination of desirable qualities rarely ever found in one metal.

It produces more bearings per pound, pours easily without trouble from shrinkage and blow holes, and results in a bearing with a fine, closely-knit grain which will far outlast the average bearing alloy.

Write for a copy of "Mogul Alloys for Better Bearings" or better still, order a trial box today.

> MUZZY-LYON COMPANY DETROIT MICHIGAN



Dealers Who Are Representing Battery, Ignition and Magneto Manufacturers

Outstanding **Features**

Demonstrated in Actual Service on America's Leading Cars

- Efficient at all altitudes
 —and in all weathers,
 winter and summer.
- 2. Extraordinary efficiency at low speeds.
- An instantaneous response to the throttle at all speeds.
- a.1 species.
 4. Only fully-vaporized gasoline enters the mixing chamber, no matter how weak the engine's suction.
- tion.

 5. Marked fuel economy—definitely and immediately apparent.

 6. Quick and easy cleaning—only 4 nuts to loosen and the whole bottom portion is removable.

 7. Viteo simplicity of dea
- 7. Utter simplicity of design, Positive mechanical action. No springs, tensions, or automatic devices. No counter-weights in float chamber,
- 8. Only one adjustment-on the idling unit.

have found that the OMAC fits in with their other lines like part of the same picture.

We don't want any Dealer or Distributor who is not willing to guarantee the OMAC as the furthest advance toward perfection in carburetor performance as yet discovered. Our guarantee is behind his -100%. And that guarantee backed by our personal knowledge of what the OMAC has done in actual service under all kinds of conditions.

If you're looking for one more good de-pendable, profitable, business-building trou-ble-free product to add to your line for 1923, write TODAY! We promise you a quick reply and the kind of proposition a high-grade go-getter will appreciate.



and the new model for FORDS

broadens the OMAC Dealer's field of operation and increases his profits.

With all the remarkall the remark-able attributes of its big brother, this OMAC model for Fords is King of its field.



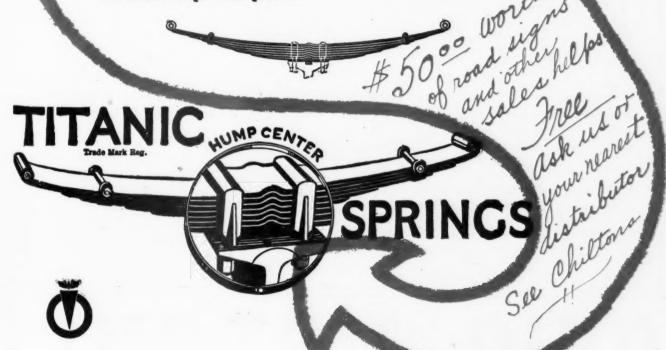
THE JENNINGS CORPORATION

404 N. Richland Street, Homewood Station

Pittsburgh, Pa.

NINE out of ten spring breakages occur at the center because of the structural weaknesses of center bolts or center nibs. That is just where the Titanic Springs are strongest, so strong they are guaranteed forever against center breakage. The leaves at the center are humped up in a sturdy, springy arch, and easy riding, secure defense against the onslaught of the rough road.

That's the story that makes Titanic a quick sale to the customer with a broken spring. Thousands of Titanics are passing over the counters of dealers who recognize the value of a good product that gives him a good profit and a good standing in his community. See Chilton's or write to us for complete information on sales helps and prices.





IDEAL for REPLACEMENTS

Exact Duplicates of Original Pistons

A new piston must do more than replace one that has been worn out in service. Often enough, it makes the sum total of difference between good will and bad.

A piston that does not fit and perform properly in an otherwise high grade service job, is as likely as not to bring adverse judgment on the whole job. YOU can offer no excuse if it goes wrong.

And you won't need to if you use Ohio Pistons in making replacements.

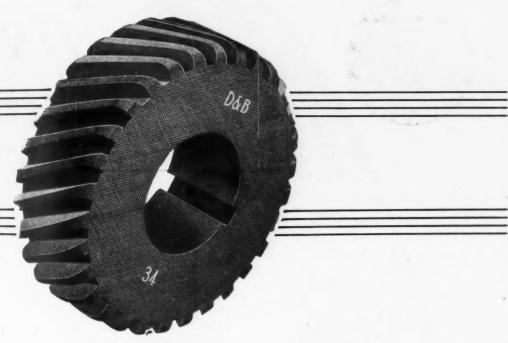
For Ohio Pistons are not only exact duplicates of the original pistons in dimensions—but also in materials, workmanship and finish. They give the kind of service and power that boosts your repair work and wins the enthusiastic commendation of your patrons.

You can buy standard or oversized Ohio Pistons from your distributor. If he hasn't ordered his stock yet, write direct.

Our trade proposition will interest you. So will our prices. Detailed information and list of Ohio Piston sizes furnished on request.

OHIO PISTON COMPANY
5330 St. Clair Ave. Cleveland, Ohio

OHIO PISTONS





"Hush-money"

Heretofore

More than a million dollars a year was paid out to hush gear noises in engines, but without securing the desired results.

Now

Repair and

Service Men
Use D & B Silent
Timing Gears — the

original—do a better job, and earn better

Avoid substitutions and imitations.

profit.

D & B Silent Timing Gears have completely and entirely eliminated these noises—and the needless expenditure.

Genuine D & B gear material is as hard as metal and has more than three times the required strength. It is available only through us, for timing gears; the accuracy and efficiency of the D & B gear is the result of highly skilled specialists devoting their entire efforts to one task, and being equipped with the most accurate, efficient and expensive gear manufacturing machinery available.

These are the fundamental reasons for their proven superiority, and their supremacy in the replacement field.

Our jobber, near you, has them in stock for immediate ship-



2333 Michigan Blvd.

Incorporated

Chicago, Illinois

Member of American Gear Manufacturers' Association.



The Haynes Automobile Company of Kokomo is one of the manufacturers of high grade cars using D & B equipment.



This tread has left its imprint on every highway in America. It is the famous Kokomo Twin-grip, rolling the load lightly and smoothly on the heavy central rib, with heavy angled wedges to grip and hold fast on turns or in loose or slippery going.

This tread is a big selling factor for every dealer. It is everything it should be—well designed, tough, resilient, durable. It is built for rough work, for hard work, for dayin-and-day-out service.

Kokomo tires have been on the market for twenty-nine years. They are established in the minds of motorists everywhere as dependable and wholly trustworthy.

Kokomo dealers are finding an increasingly active demand for these sturdy tires. The Twin-grip and its husky brother, the Crusader, are breaking all records this season.

Get your share of this good business

KOKOMO RUBBER CO. KOKOMO, INDIANA

RESAND TUBES

Will Your Pump in Less Than

Fill a 15 Gallon Tank a Minute?

CPEED in filling station service is the outstanding demand in motordom today.

Slow dispensers and complicated pumps waste profits for the station and time for the motorist. Trade flows fastest where the gas flows fastest.

The Findlay Right-A-Way Visible air pressure gas dispenser will put 5 gallons of gas into any car every 20 seconds. A slight pressure on a button starts the flow.

The Findlay Right-A-Way dispenser embodies a new patented air control principle. It doesn't depend on gears, motors, pistons or troublesome valves.



The Findlay Right-A-Way Visible dispenser is so simply and strongly made that repair trouble and even wear are practically eliminated. It operates on very low air pressure taken from regular supply. Never needs oiling. Automatically accurate. Bears underwriters label. Handles all grades of gas. Burglar proof and fool proof. Does not agitate the gas. Cuts evaporation waste. Is 6 years old, tested and proven by actual service. The only dispenser guaranteed against wear as well as defects for five years.

Garage & Filling Station Men

To learn how to increase the volume and profit on your gasoline

MAIL THIS COUPON TODAY!

Manufactured by

The VISIBLE PUMP COMPANY, Inc.

Findlay, Ohio

Findlay,	Ohio	
Please tell	me how I can increase the volume and proof on my gasoline business.	rofit
Name		



The Strongest Guarantee
ever put back of a shock absorber
We will replace any spring equipped
with a GIANT SHOCK ABSORBER
that breaks within a year from date
of installation.

The front spring action is absorbed through the Shackle Spring Construction of the Giant—all stress and strain being eliminated.



When the rebound occurs the severity of the strain is centered in the spring ends. The Giant coil spring—fitted between springs—"takes up" the rebound and prevents breakage.



A Wonderful Opportunity for Quick Sales and Profit

The remarkable guarantee terms back of the Giant Shock Absorber open the way to big sales.

The car owner is not only protected against spring breakage—but is provided with riding ease and comfort equivalent to that enjoyed by owners of high priced cars—expensively equipped.

The best of springs break. A sudden, severe shock or extra heavy jolt—an unseen hole in the road—and the spring snaps. The terrific rebound does it.

Broadcast the guarantee terms supporting this exceptional Shock Absorber—and keep on doing it. Car owners using the Giant Shock Absorber are frank to admit that it does more than we claim it does. Its cushioning effect is unusual. Its absorbing qualities remarkable.

Easy to Install

Installation is extremely simple—does not mar the car in any way—all fittings are in unison with fittings of the car—nothing to rattle or get loose—the Giant can be bolted firmly to the springs in an hour.

Low in Price

\$22.50 complete, is a price that enables you to *more* than compete. It is a *lower* price for a high grade product.

Dealers:—the Giant Shock Absorber has selling features—and a price—that puts you in a position to make real profits quickly. If your jobber is out of stock—write us direct at once and cash in on this live proposition.

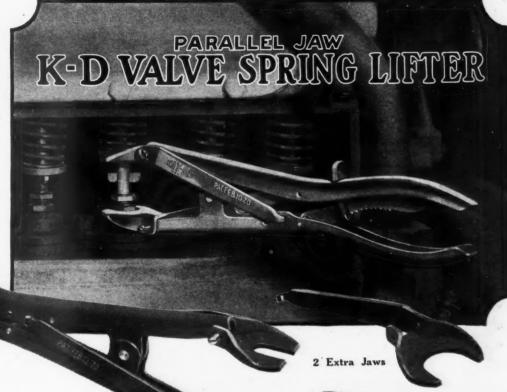
Red Giant Tool Corporation Lynchburg, Va.

We would be interested in hearing from good specialty representatives



Note how the jaws remain parallel throughout the entire lift. This exclusive feature eliminates all possibility of the washer or spring binding on the stem and raising the valves.

Also note that there are no hands holding the tool, thus allowing operator free use of both hands.



Prepare Now for the Heavy

Spring and Summer Repair Work

ATTENTION!

Do you know that two of the largest automobile manufacturers in the U. S. A., namely, The Peerless Motor Car Co. and The Studebaker Corporation of America, have specified the exclusive use of K-D Parallel Jaw Valve Spring Lifters?

K-D No. 100 Cut-Out Pedal



Write for descriptive circular.

List \$1.00

There will be more valves ground and adjusted in the next six months than at any other time of the year. Are you prepared by having the proper tools?

The K-D is the one Valve-Spring lifter that replaces valves as easily as it removes them. Furthermore, they do the work more quickly.

Get these exclusive K-D features

- 1. Jaws Remain Parallel throughout the entire lift, eliminating all possibility of the washer or spring binding on the stem either in removing or replacing the valve.
- 2. Locking Device will stay locked in eleven different positions and will hold lifter in place when the spring is raised, thus allowing operator free use of both hands.
- 3. Extra Jaws, instantly interchangeable, make the tool adaptable to practically all sizes and types of motors.
- 4. "Parkerized" against rusting and made entirely of pressed steel. Practically indestructible. Guaranteed against defective workmanship and material.

If your regular jobber cannot supply you, write us for description and discounts, and tell us who your jobber is.

K-D Manufacturing Co. Lancaster, Pa. K-D Special Lifter for Fords and other small cars

The K-D "Universal" fits practically any make of car. Complete with

extra set of List \$2.10



All the advantages of the "Universal," with the exception of the removable jaws. Enables you to remove all valves from Ford motor without removing carburetor and manifold List \$1.10

USE THIS COUPON

K-D Mfg. Co., Lancaster, Pa.

Send me description and discounts on K-D Valve Spring Lifters.

ame.....

Address.....

My Jobber Is.....

Now for a big Summer

If you're on the lookout you'll find that many of the cars that you service this summer will come in with battered and stripped flywheel gears.

This is a car trouble that is very common—why not be in position to cash in on it?

With an assortment of Logangears you can do some "cash on the spot" gear replacement business that will look mighty good in the Summer's totals.

The job of installing Logangear

is not difficult and it doesn't hold the car up long.

It's simply a matter of turning off the old gears on a lathe and shrinking the Logan Ring.

The job pays good money and it makes the flywheel better than new.

Get ready for this summer's business. Write for the catalog of standard sizes.

KAUFFMAN METAL PRODUCTS CO.
Bellefontaine, Ohio



LOGAN Semi-Finished Piston Pins

Carry a small stock of semifinished pins and grind them to fit on the Logan pin grinding mandrel.

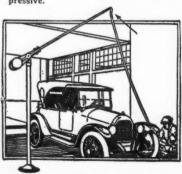
Finished pins can be supplied if desired. Ask for the details.

LOGAN Air Tower

A quick, clean efficient way of serving air to the motorist.

The movable arm can be swung around to all four tires—the motorist can do it himself.

The LOGAN doesn't take much room. It can be placed where it will always be accessible and still be out of the way. It makes your air service impressive.



This Logangear is made of a bar of 1035 S. A. E. steel, shaped to a ring, heat treated and electrically welded at the joint. It has no weak point. The gear teeth are then cut to accurate pitch and given a scientific correct chamfer which insures a perfect mesh with the starter pinion. The finished ring is then hardened.



The teeth are rounded to an angle of 45°—a design which was developed in collaboration with one of America's greatest Starter manufacturers — and which affords quietness of mesh and maximum strength in each tooth.

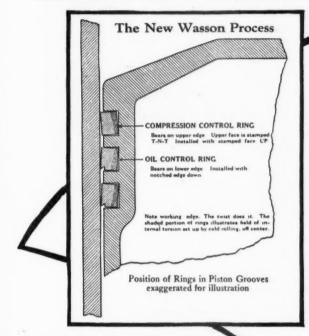


LOGANGEARS

A Revolutionary Development a piston ring in a class by itself:

Let's prove it!

YOU know R. B. Wasson—the man who developed the hammered piston ring. Now he's perfected a new ring—one that has proved-up to be far more efficient than any yet produced. It's the T-N-T—the last word in piston-ring construction. And a star money-maker!



Here's What They Do

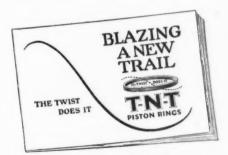
Under all kinds of shop and road tests T-N-T Piston Rings exceed all known standards of efficiency.

They absolutely guarantee at least 50% more mileage per gallon of oil on any car or truck.

On a Moon fitted with T-N-T the increase was 60%—on a Cadillac, 75%—on an Oakland, 200%—on a Chalmers, 300%. The Ford average is 1,200 miles per gallon.

Due to an internal, spring-like twist given the fibres of the metal, a working edge is always in contact with the wall—at all points. Result—practically perfect compression—an increase in power—elimination of carbonization—reduced friction.

Any old-style ring making flat contact deteriorates from the moment it is installed, and at the same time needlessly punishes the cylinder wall.



Are You Standing Still on Piston Rings —

Don't be satisfied with mere bread and butter profits. Here's your chance to make big money on piston rings.

Sell the truck-fleet owner an easy 25% saving on his investment in his fleet. That's what T-N-T equipment will hand him!

Sell the service and garage man more-than-satisfied customers—and a bigger profit with no grief. **T-N-T** will insure his business.

Sell the car owner lower cost of operation and double the life of his motor. Sell an asset instead of a liability.

Are you going to stick to old-fashioned time-worn methods and see the other fellow pocket the bigger profits that only **T-N-T** can pay? Or will you be the man in your territory to realize on the big-money possibilities of the best piston ring on the market?

It's up to you.



Send for this book—

We've just issued an exhaustive sales-manual for Distributors and Dealers giving all the facts about T-N-T Piston Rings. A wealth of sales information is also included.

information is also included.

"Blazing a New Trail" the book is called. If you want to know how to obtain increased motor efficiency—if you want to know how to push your piston ring sales ahead, you want this book. Write for it.

Some valuable territory franchises are still open. Ask for our dealer proposition.

T-N-T Engineering Co., Inc., Newark, N. J.

The twist does it



The secret of Russell, Burdsall & Ward's dominance in the bolt and nut field is found in the simple quotation above.

RUSSELL, BURDSALL & WARD BOLT & NUT COMPANY

PORT CHESTER.N.Y.

EMBERWICK, CONN. • CHICAGO • SAN FRANCISCO

ROCK FALLS.ILL.

Makers of Bolts, Nuts and Rivets Since 1845

EMPIRE BOLTS

At lasta Quality spring cover at a remarkable price

LUBRICATING Spring Covers are a necessity for protection of springs against water, mud, dust and rust. And for the banishing of spring squeaks.

Albe Lubricating Spring Covers combine the best features of *metal* and *fabric* covers. They are good looking, durable, easy to install, permit the use of any force feed lubricating system and are remarkably priced, quality considered. You can retail Ford sizes for \$2.85 a set—other popular sizes like Buick, Studebaker, Chandler, Hudson, Dodge, etc., \$10 to \$11 a set—and make a liberal profit.

In the Albe you get our metal-sealed joints. Note the metal binding strips at ends and bottom. This improvement insures a tailored fit and makes the installation simple and easy. It also does away with unsightly hooks, laces and eyelets — and it provides a waterproof, dirtproof and dustproof joint.

To apply it is not necessary to remove or alter a single nut, bolt or clip. Easy to take off or to put back on again.

High-grade Distributors, Jobbers and Dealers are invited to get in touch with us at once.

THE ALBE MANUFACTURING CO. 7100 EUCLID AVENUE :: CLEVELAND, OHIO

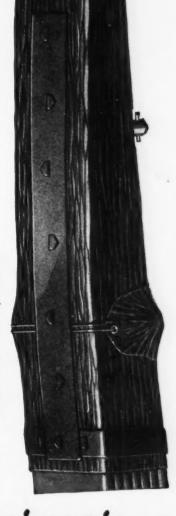


Easy to make a snug fit by the exclusive Albe method.

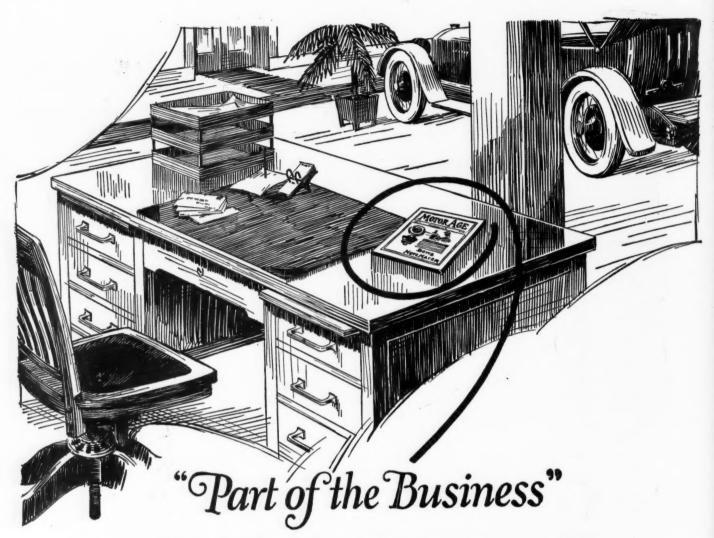


Use any force-feed lubricating system—grease or oil.

A real money-making opportunity now open in many territories—every car dealer a prospect. Easy to line them up with the Albe and profitable for you and for them. Approximately 35 sizes of sections permit you to fit over 136 makes and models of cars. This is your opportunity. Write today for full information. Albe prices plus Albe Quality make the fastest selling line ever offered.



AIIB Lubricating Spring Spring Covers Careland Covers



I F an automotive merchant could travel through the country asking hundreds of other automotive merchants about their methods of doing business—if he could find out why some businesses have failed and others prospered—if he could hear the personal stories of success from the acknowledged leaders of the automotive trade—if he could do this he would return home a far broader man and a more progressive dealer than when he started. His mind would be filled with new ideas. His enthusiasm would be kindled. And his business would reflect the valuable lessons learned.

MOTOR AGIE

See manufacture of the see of th

MOTOR AGE is making such a trip possible to thousands of automotive merchants the world over. Yet these men need never leave their desks, for in its columns MOTOR AGE presents information of inestimable value gathered from every conceivable source.

MOTOR AGE

5 S. Wabash Ave.

Chicago, Ill.



This is the Monogram Sellengine

It starts sales and keeps them going. It doesn't miss, backfire or knock. It starts sales by catching the customer's attention. It keeps sales going by putting Monogram Cap and shields into the customer's hands.

You never bought a thing without examining, testing, trying it. Are your customers any different? Turn the page to see how the Sellengine works.



The minute you see anyone showing interest in the Sellengine (everybody does) lift out the cap, and place it in his hands.



While he is examining it, get down the right cap for his car, and the shields with his initial and fraternal emblem.



Spread the shields on the counter while you tell him how Monogram Cap protects his motor meter, adds to his car's looks, makes filling a radiator easy.



When you've told him all, reach for the cap and say: "I can put it on in three minutes; which shield do you like best?"



Fasten on the one he prefers, and if he hasn't a motor meter, set one in the cap, and let him see the effect. If he says nothing, or agrees that it's fine, attach the motor meter.



Then screw the whole on his radiator and take his money. If he doesn't stop you when you begin to attach the shield, keep right on: he's sold. No direct asking to buy, but just a logical follow-up of what the Sellengine started for you.



And Here's Another Help-You-Sell

MONOGRAM ORIGINAL Self Locking Radiator Cap

This mahogany finished display pedestal is almost as good a help-you-sell as the Sellengine. In your window it fits into any display scheme. On your counter it lifts Monogram Cap up before the buyer's eyes so attractively that he wants to give you your profit right away.

Your Monogram Distributor can supply you with both the Sellengine and this beautiful pedestal. Ask him for them.

GENERAL AUTOMOTIVE CORPORATION
600 West Jackson Boulevard
Chicago, Illinois





FAN BELTS

Vee Round—Flat Type

Millions of Fan Belts

are sold every year. Those that give the most satisfaction are labeled Rie Nie. RIE-NIE VEE-ROUND FAN BELTS grip the pulleys. Their soft rubber compound core automatically flattens the belt to a true V shape that presents maximum gripping surface to the pulley sides. That's why Rie-Nie Vee-Round Fan Belts do not slip. RIE-NIE FLAT FAN BELTS are built like an auto tire. Ply upon ply of sturdy, tough fabric impregnated with heat and wear-proof compound and sealed in a special coverply that resists all oil, grease and heat. Like the Vee-Rounds, Rie-Nie Flat Fan Belts are favorites everywhere.

A Complete Fan Belt Stock

With Fewer Sizes

Fewer sizes and smaller stock means quicker turnover and better prof.ts. Dealers do not have to "sell" Rie-Nie Fan Belts. Motorists know Rie-Nies for their real worth and ask for them by name. Send for Rie-Nie Fan Belt Wall Chart today.

Rie-Nie Automotive Products Are Sold Through Jobbers

NURKEE-ATWOOD MINNEAPOLIS, MINN, U. S. A.

Riesie Automotive Products

Fan Belts
Gasket Cement
Graphite
Grease
Patch
Pedal Pants
Rim Paint
Rubber Cement
Tire Paint
Aluminum Enamel
Battery Paint
Bearing Blue
Carbon Remover

Fine Parts Oil
Leather Dressing
Lining Top Dye
Mohair Dressing
Polish—Auto Body
Radiator Cement
Orange Shellac
Shellac (Gasket)
Soap—Auto Body
Spring Lubricant
All in One Dressing
Clutch and Brake Compound

Enamel (Air Drying)
Enamel (Cylinder)
Metal Polish and Nickel
Polish
Painting and Refinishing
Outfit
Rubber Filler and
Cement
Tire Mica and Tire Talc
Valve Grinding Compound
Varnish (Clear Auto)

They Never Ride out of The Pulley

A Rie Nie Vee-Round Fan Belt never rides out of the pulley.

Its special core automatically wedges the sides to a true V-shape presenting maximum gripping surface to the pulley flanges.



This Is the Tire Pump They Want

Here's why. Ordinary tire pumps have no satisfactory provision for *permanent* lubrication of their valve leathers. As a result the leathers are inclined to quickly dry out and crack. Compression becomes weak and soon is gone altogether.

MONROE valve leathers will never dry out or crack. By means of the *patented* MONROE *Self-Oiling* Washer they are kept constantly soft and pliant. Always full compression. A barrel of air to the tire with every stroke of the plunger.

That's why your customers want the MONROE SELF-OILER. That's why they'll buy it. They're looking for a pump that they can put in their tool box and know it will be ready for business when the emergency arises.

Now, about yourself. You want to stock and sell a pump that will uphold your own good reputation. You want a pump that you can sell at a low price. You want to derive a clean profit from every sale. Lose no time, then, in laying in a supply of MONROE SELF OILERS. They'll quickly sell—you can bank on that. And they'll give lasting satisfaction to the purchaser. Send for particulars and prices now before spring business opens up.

Jobbers: Make sure that you have an ample stock of MONROE SELF-OILERS on hand. The demand will be heavier than usual this spirng.

MONROE AUTO EQUIPMENT MANUFACTURING CO.

Monroe

Michigan

Monroe

Sales Representative to Jobbers Only

The Fulton Company Milwaukee, Wis.

The lilustration to the right quickly and clearly shows why the MONROE Solf-Oiling Tire Pump never falls to deliver a full head of air to the tire. A felt washer located just above the valve leather, is thoroughly impreparated with a leather-preserving oil. On each up-stroke of the plunger a little of this oil is released and is absorbed by the leather. This keeps the valve leather soft and pliant so that it readily spreads on the slightest down-motion of the plunger, completely filling the cylinder and preventing all possible chance of leakage. Sufficient oil is stored in the felt washer to last for years of service.



Every dealer who has handled the MONROE Spotlight Bracket and the MONROE Brake Shoe for Fords is well aware how fast they sell. Dealers, who have not, are missing a splendid source of extra profit. Send, at once, for full particulars and prices







How many industrial establishments in your territory?

Upon your answer depends the profit you can make

Wherever there is material to be moved—there is a prospect. Right now—over 30 different types of industries are utilizing the Towmotor for industrial haulage.

And prominent dealers throughout the country are "taking on" the Towmotor as a source of added profit at no increase in overhead expense. It fits into your plans. It is built on automobile practice and serviced as a motor car.

One dealer (name on request) sold about \$40,000 worth of Towmotor equipment in 3 months.

Right at this point—stop and think....what's in your territory besides possible car and truck buyers?

We say "possible" because conditions in the passenger car and truck field are not what they were a few years ago.

There are thousands of Industrial Tractors yet to be sold,—one railroad uses 300—one metal works uses 120—and opportunities are plentiful in nearly every part of the country. Just remember one sale invariably brings repeat orders from the same plant.

Dealers—labor scarcity is approaching, and labor is high these days, too. Townotors are labor savers—and your pres-

ent staff of salesmen can "talk" Towmotors to industrial managers as easily as they now "talk" cars and trucks to prospective buyers.

The Towmotor is not a remodeled automobile—it is a complete, all steel, rugged industrial tractor, gasoline driven, and powerful enough to move freight cars and yet operates economically on light loads. It is a credit to your show room. It is the sturdy aristocrat of the industrial tractors.

The field is rich in profit possibilities and progressive dealers looking for increased income will find it extremely advantageous to fill out and send in the attached coupon.



The Towmotor Co., Cleveland, Ohio.

> Please send complete information about the Towmotor and details of your cooperative plan.

Name _

THE TOWMOTOR COMPANY, Cleveland, O.

The TOWING MOTOR of INDUSTRY

Address ..



There Is Extra Money Now for the Shop with Storm Cylinder Finishing Tools

Without adding to your expense, without putting on one single extra man, you can make more money now than you ever did before. With an investment as small as \$36 in a Storm Finishing Tool you can turn out the most profitable kind of work in the shortest time. You can do jobs that you used to turn down. You can give a finish in cylinder work never before approached by mechanical means. You can do it in less time, do it better, and make more money on every job.

Eight cars out of ten need cylinder servicing. They are running with worn and scored cylinders, poorly fitting pistons. Dozens of these cars can be cylinder refinished with these new Storm tools without even removing the engine, in jig time, at handsome profit.

Dut One of These New Storm Cylinder Finishing Tools at Work in your Shop

It will be the best investment you ever made, the fastest money maker you ever employed. Made and guaranteed by America's oldest cylinder equipment manufacturers. Order from your jobber immediately and be prepared to make the big money from spring motor work.

Storm Cylinder Finishing Head A Tool You Will Use Every Day

Used with electric drill or drill press to finish worn and scored cylinders (up to .005") without previous machining operations; or to polish after boring, grinding, reaming, etc. Gives a working polish and gun-barrel finish heretofore found only on costly foreign built engines. Permits a perfection in piston fitting that means long life and a smooth running motor without old fashioned running-in methods.

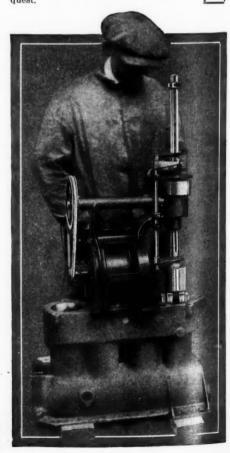
The patented Storm Cylinder Finishing Head is absolutely self-centering at all times. Without any parts, blades, or hones, etc., to be changed this head finishes cylinders from 234 to 8 in. with unvaryingly correct pressure. Whether used for straight refinishing alone or to follow boring, grinding, etc., a Storm Finishing Head will earn you more extra profits than any other single tool or machine in your shop. And best of all, you are not buying a tool to throw away later for when you want a Storm Power Finishing Machine you already have the finishing head that goes with it.

Storm Cylinder Finishing Machine

Performs the same work as the Storm Finishing Head which is a unit part of this machine. Portable and electric driven. Quickly set on block either in or out of chassis and as quickly changed from one cylinder to the next. No clamping to block and no aligning required. Automatically self-centering. Automatic reverse feed adjustable up to 20 inch travel. The r.p.m. of the head and the speed of the feed are always under positive, correct control, the same as on highest priced grinding machines. Here is a complete, portable power cylinder finishing machine that is thoroughly automatic and positive in all its actions. No mechanic's time required to operate. The biggest money making tool ever offered the garage

Dept. A., 406 Sixth Ave. So., Minneapolis

Send for the Storm Catalogue. It describes the full line of celebrated Stormizing Machines, Storm Tools and Storm Garage Equipment. Free on request.





Not just a windshield cleaner It's a Folberth!

THE Folberth Automatic Windshield Cleaner is not a makeshift contraption that attracts a few unwary buyers and then goes dead on your counter.

The Folberth is a finely made instrument, scientifically conceived and thoroughly reliable, that grows in popularity as sales pile up.

Operating on the suction of the engine, via a rubber tube from the intake, the Folberth provides a wiper that is automatic and yet amazingly simple.

Turn the button and the arm sweeps back and forth, cleaning a wide arc of safety on the foggy windshield.

The Folberth counter displays attract and interest and sell. Hundreds of dealers have discovered that. Write your favorite Jobber for the Folberth details today.

All Cleveland street cars are equipped with Folberth Cleaners as a factor of safety.

The Folberth Auto Specialty Co.
Cleveland, Ohio
U. S. A.

FOLBERTH

Automatic

WINDSHIELD CLEANER

VACUUM OPERATED—"IT CLEANS WHILE YOU DRIVE



Westcott Reo Meteor

and many other wellknown makes.

Double Contact

and the double assurance of a good contact

The Twin Timer embodies a perfect adaptation of both the wipe and roll contact principles—a unique construction which makes possible the retention of the good points of both types and the elimination of their weaknesses.

This is the Twin Timer construction in brief—The four segments, instead of being embedded in the fibre ring, extend inward from the casing and intersecting the path in which the Rotor travels.

These segments, placed with absolute accuracy, are tapered like the blade of a knife and curved to conform to the path of the Rotor.

The Rotor has two opposing brushes both of which are free to turn on their axes and move laterally against spring pressure.

Contacts are made when the two

opposing brushes are intercepted by the tapered segments.

At the instant of interception there is contact which gives an immediate full bodied connection.

As the interception is completed the brushes turn slightly presenting a fresh surface for the next contact.

Regardless of speed each contact is positive and unfailing and remains unbroken during the period of interception.

No insulating material is placed where there is any wear—the construction is simple—there are few working parts and it is plain that what wear occurs on the hardened steel brushes will be an even wear all on sides of brushes which cannot affect performance.

Full details on request.

E. D. HODGE TOOL & MFG. CO. Watertown, N. Y.

Guarantee

Suaranteed to give a sure sychronous spark without attention longer than any other Timer you can buy, regardless of Price.

Suavanteed that this accuracy will be maintained without altention up until the time that the device is absolutely when out. Suaranteed that you will never have trouble starting in cold

weather due to not having a perfect contact in your Timer as long as you have a Twin Timer on your Car.

We gustanthe satisfaction and that your Cannitt pertain better, will throttle down slywer go faster and putt a titl better, without missing than it ever did before or refund your money.

This guarantee is void unless installed as directed, viz: Fill one-fourth full of Vaseline and set so Spark will break on dead center when spark lever is in full retard.

E. D. Hodge Jool & Mig. Co. Watertown, New York The Twin Timer has no rheostatic effect, thereby transmitting 100 per cent of current supplied. All contacts are accurately spaced and in perfect synchronism with the mater.





SIZJES Padnaught Tire Chains

will supply 93% of all chain users

A small stock of chains means a small investment and will allow you to carry and display a complete stock of chains in summer as well as in winter.

Quick and frequent turnover of the small stock means a substantial net profit.

Sell Dreadnaughts all the year around to secure maximum turnover and greatest profits.

The following 9 sizes of Dreadnaughts will fit the specifications of 125 manufacturers.

Chevrolet Ford Gray Overland Seneca Star 31 x 4 31 x 4 Auburn 6-45 Buick 1923-34-5-6-7-8 Cleveland Columbus Davis Dort Durant Elcar Jewett Maxwell Moon

30 x 31/2

Moon Seneca Studebaker (L-6)

32 x 4 Anderson Auburn 6-5B Barley Chalmers Columbia Courier Davis Dodge Earl

PLANTS:

Tonawanda, N. Y.

Lebanon, Pa. Columbus, Ohio

Essex Franklin Gardner Hanson Hatheld A-42 55 Hupmobile Jordan Kelsey Kissel Liberty Merit Mitchell National Oakland Oldsmobile 43-47 Premier Premier R & V Knight Reo Rickenbacker Rubay Stephens Studebaker (Sp-6) Stutz Velie

33 x 4 American Anderson Chandler-6 Elcar

Flint Lexington Marmon Nome Paterson Pilot Premier Willys-Knight

Apperson Auburn Case Durant Princeton
R & V Knight
Roamer
Stanley

32 x 41/2

Stutz Westcott Wills-Sainte Claire Willys-Knight

American Bulck

1923-41-4-5-7 48-9-50-4-5 Crawford Moon 6-58 Oldsmobile 46 Packard 135-335 Paige Stephens Studebaker Big 6 34 x 41/6 Apperson Case Hudson—6 Nash—692-4-5 Standard Stearns-Knight 33 x 5
Cadillac
Cole
Crawford Dagmar
Cunningham Daniels Dorris Duesenberg Haynes Lincoln McFarlan Peerless Pierce Arrow Winton

35 x 5 Locomobile Packard Rolls Royce

Ask your jobber for complete details of our 1923 merchandising plan on tire chains or write direct.

General Sales Offices:

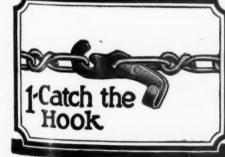
The Columbus McKinnon

Chain Co. Columbus, Ohio IN CANADA: McKinnon Columbus Chain, Ltd. St. Catharines Ontario

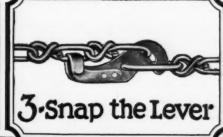


Secure the use of the Dreadnaught "Ask-em-to Buy" Cabinet, by placing your order with your jobber. Puts the chains on display. Will increase your

The "Lever" Locks the Chain









218,000 Friends
The Brookins Measure has made 218,000 friends for jobbers and dealers who sell it.
It has done so because it is so thoroughly satisfactory,—such a great improvement over the ordinary measure. Its flexible metal nozzle, its thumbcontrolled valve, its special rim. controlled valve, its special rim, preventing overflow, — these things actively please the man who uses it.

These will be 27 000

There will be 75,000 new friends made for jobbers and dealers this Spring by the Brookins Measure. They will include garages, filling stations, auto, truck and tractor owners.

Be sure your stock of Brookins Measures is large enough to handle the Spring demand. Remember there's a generous profit and a new friend in every sale.

THE BROOKINS MFG. Co. 145 Bayard St., Dayton, Ohio Export office, 11 Broadway, New York City. Cable Address, "Brookins" New York, All Codes Used.

> Made in copper finish, in gallon, two-quart and one-quart sizes.

rooku

ALL-IN-ONE LIQUID MEASURE



Every shrewd battery man figures his equipment cost against the life and performance of the equipment. Measuring its performance, long life, and money-making advantages, Ambu Equipment is the best "buy" in a Battery Servicing Facilities. Here are a few of High Quality, Ambu's Money-Makers and Money-Savers:

MBD Plate Burning Racks



out of alignment until you remove them. A post support bar, clamped at each each end, locks the plates into the comb. A set of adjustable bars, which enzingtes the equipment. The Type "B" or Large Ambu Rack, here illustrated is universal for all standard styles of plates groups. It is 19% inches long, permits burning three groups of plates at a time. An ideal outfit for battery shops that want to be equipped to handle repairs on all types of batteries.

The Type "A" or Seell"

Battery Plate Press



608 Pages of information that can be turned in

Every battery repairman knows the trouble caused by bulged negatives—trouble in reassembling them in their bulged state, inability to charge them properly, and trouble with "comebacks" from customers who complain of low power and output from repaired batteries.

milled to correspond exactly to those in the post. Once set in the base slots, with their lugs in the slots of the comb, plates cannot get out of alignment until you

With an Ambu Plate Press you can banish all these troubles, and by pressing all negative plates you can give your customers better work. Press is made of heavy cast iron brace, steel screw and 14 inch, handwheel which affords strong pressure.

AMBU Threaded Post Strap & Sealing Nut Mold

Ambu Threaded Post Strap and Sealing Nut Mold will make three threaded post strap and sealing nut castings a minute. Equip your shop with these molds and save money by making new castings from the scrap lead that daily

accumulates in your shop. Why pay ten to eighteen cents a plece for these parts. when, with these molds, you can make them yourselfand in less time than it



MBD Battery Turntable

Speeds the Job-Saves Work

The repairman who has this turntable can get at any side of a battery with a touch of the hand, and without laying down his tools. The turntable has sufficient friction to keep the battery from turning except as the repairman

wants. The turntable also may be used when working on heavy generators and starting motors.

Turntable is made of two stout bases of acid proofed hardwood, plyoted to each other by a roller-bearing swivel made of heavy maleable iron. Cannot be damaged by acid, is large enough to handle the heaviest jobs, and worth many times its cost as a time and labor saver. labor saver. Price only



Order Today a Copy of the Big New Third Edition of THE AUTOMOBILE STORAGE BATTERY

Its Care and Repair

Most Practical Hand Book Ever Written on Storage Batteries.

A valuable ready reference that "gets right down to the workbench" with Storage Battery jobs just as they come into the shop. It covers each operation in a way that leaves nothing unanswered. Photographs and diagrams illustrate every difference in handling various makes of batteries. Valuable hints are given upon every phase of conducting the business, from getting and holding customers to keeping books, and negotiating and using credit. Tells how to set up a business in a small rented space to the conduct of the largest type of battery service station.

It tells about the equipment and tools required. Shows aketches and plans for shops and service floors. An unequalled collection of dependable information arranged to render definite, practical service. Whether you use batteries, build, sell or service them, there is something valuable in this book for you.

Only by actually reading it, can you begin to appreciate its value and many advantages, advantage of our offer to send it to you on five days' approval by putting a cross in the provided in the coupon at the right, and mailing it to us today. Price delivered, only \$5.00.

Leading Jobbers Sell Ambu Products

Service Equipment Division

American Bureau of Engineering, Inc.



2634 Prairie Avenue, Desk M. A.

Chicago, Ill.

shops and der definite, as something the space only \$5.00. 2634 Fratre Monthly and Street TOWN State



STRETCH? NO!!

If a Master-Cord Fan Belt ever stretched we never heard of it. The construction shows why. And as far as breaking is concerned, we never expect to hear of such a thing unless somebody uses an axe. When you see these belts you can look your customer squarely in the eye. Forget all about "come-backs"—you'll never have 'em on these belts.

Quality Belts At Go-Getter Prices!

Take a look at one of our Master-Cord Belts and you'll see for yourself what we mean by saying it's a quality belt. Then compare our prices with others and draw your own conclusions. There are cases where our list prices are no higher than others are asking for ordinary fabric belts.

On top of all this, dealers make long profits handling our line.

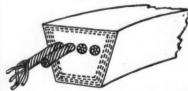
DEALERS! Get In On This Proposition!

Instead of worrying about the other fellow, make the other fellow worry about you. Get the edge and you're all set for some mighty sweet profits. Write for details of our proposition and complete price list for all cars.

MASTER-CORD BELT CO.

Denver, Colorado

And Here's Another Winner!



MASTER-CORD MOULDED "V" BELT

Follows the same general construction as the flat type, with endless cords imbedded in a special pliable compound under hydraulic pressure, and the outer walls of fabric. Each belt fits perfectly the pitch of the pulley on each separate motor.

Motor Transport

A magazine for the Fleet Owner, furnishing reliable and accurate news, information and advice on how to economically operate fleets of motor vehicles.

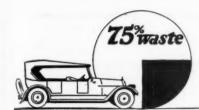
Contains statistics, diagrams and special articles, treating of successful truck operation in all the different trades and industries—Department Stores, Contractors, Shoes, Coal, Wood, Lumber, Dry Goods, Oil Delivery Companies, Bus Lines, Telephone Companies, etc., etc.

Read by leading Fleet Owners throughout the country—men, firms and corporations who own and operate from 5 or 10 up to hundreds of motor vehicles. One subscriber, for instance, owns and operates upwards of 1800 Trucks and maintains 30 Garages and Service Stations. MOTOR TRANSPORT is the only publication in this particular field and is a real necessity to Traffic Managers, Garage Superintendents and others who look after the care and operation of fleets of motor cars, trucks, busses, etc.

MOTOR TRANSPORT is published twice a month, on the first and fifteenth. The subscription price is \$2.00 a year (2.50 west of the Mississippi). Sample copies will be sent upon request.

MOTOR TRANSPORT

239 West 39th St. New York, N. Y.



Only 4 of the Brake Power Utilized

CAR STOPS HERE



100% Brake Power Utilized

CAR STOPS



The accident usually occurs when the emergency brake doesn't get sufficient enough grip to stop the car quickly.

Look at Fig. 3 and you'll see why. This shows that only a small proportion of the standard brake shoe grips the surface of the Drum. Put a standard Ford shoe inside a Ford brake Drum — expand it — and note amount of clutch on Drum.

Fig. 1 shows Archer Hinged Brake Shoe expanded. Note grip over entire surface of Drum. It contacts the entire surface except at and openings. 100% service. Four times the brake power of any other shoe.

Fig. 2 shows Archer Shoe open. Note uniformity of release. Scientific placing of hinge produces this. All Archer Hinged Brake Shoe Features are patented.

100% Archer—4 times the brake power—lasts a lifetime—almost impossible to break it.

"Cash in" on the 75% waste

The ordinary emergency brake shoe grips only a few inches of the Drum—or about 25% of the Drum surface.

The ARCHER Hinged BRAKE SHOE grips over its entire surface—not a few inches—but 100% grip on the Drum.

The Ford owner can use the 75% waste — he needs it—he wants it—he'll buy it quick. Show it to him—and sell it.

Dealers—you can tell the minute you look at the construction (shown at left) of the "100% Archer," how it works and why. You can also see the huge sales possibilities and no mistake—they're there.

\$1.50 a pair—and a fine profit in every pair—for you. West of Mississippi, \$2.00 a pair. Ask your jobber today or write direct. Dealers sending for a sample pair will receive a rebate of their commission as soon as received, and literature will be sent with the shoes.

Manufactured by

SAMUEL B. ARCHER

Electrical and Mechanical Engineer Designer and Builder

Automobiles, Parts and Accessories, also Automatic and Special Machines for Making Any Part of an Automobile

SARATOGA SPRINGS, N. Y.



There's Profit for You in the extra 75%



The Rustiest Nut Is Loosened

No matter where it is, or how fast it's stuck, TASGON will quickly dissolve the rust, lubricate—and free the part.

Rusty Springs Squeak No More

No jacks or wedge is needed. TASGON penetrates the corroded surfaces between spring leaves like magic—dissolves the rust—lubricates—and brings back the same smooth spring action that influenced the sale of the car when it was bought.

The Engine Is Rid of Carbon

An ounce of TASGON, applied to your motor every 500 miles, will rid it of carbon forever. Inject through pet cock or spark plug opening—preferably at night, when the motor is warm.

TASGON also cleans spark plugs. Primes the motor.

Squeaks Disappear From Body Parts

A little TASGON on a cloth removes rust and grease from nickeled parts.

TASGON dissolves the rust on hinges and door locks—lubricates them so they work easily.

And it has hundreds of uses on the car and in the garage.

POLYGON PRODUCTS CO. 141 Milk Street, Boston, Mass.



TASGON dealers are furnished with a sales-bringing assortment of live counter display material. Our trade proposition will interest you. So will the discounts.

Write for the details-NOW.

Here's the can that will save a hundred times its cost—in time, labor and patience.

Half Pint, Nozzle Top......65c
Pint, Nozzle Top.........\$1.00

TASGON

The Magic Fluid That Dissolves Rust



FASTER! FASTER! FASTER! THEY GO! POWER FASCINATES

and so it is with

FOSIER

sensible lightweight

PISTONS

The reason is-

That they give extra speed — they combine it with an indefinite period of fascinating usefulness.

Mr. Jobber—the wide recognition of losier pistons is growing greater every day. You can turn a stock of losier pistons quick,

FOSIER pistons quick, because it is a product the motoring public requests—they need it.

Get our proposition. It is liberal.



The F-J piston reamer provides the easiest and fastest way to fit wrist pins.

Our reamer catalog lists a complete line.

FOSTER-JOHNSON REAMER CO. 1046 Beardsley Ave. Elkhart, Ind.



On Steering Knuckles

Are you having trouble in rebushing steering knuckles? This is a ticklish job at the best. Just a few thousandths play and a bad rattle develops. In other words, unless the bushings are reamed accurately, you have a dissatisfied customer.

This is just the job for a

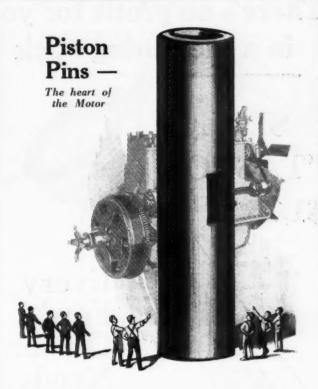
Quick-Set

Quick-Set gives you accuracy—accuracy in manufacture and in reaming. This reamer is designed to cut on all six blades, and when, after long hard service, new blades become necessary you may replace the blades at a minimum of expense. The old Quick-Set goes back on the job practically as good as new. No grinding or fussing. The blades fit, for they are made right.

Order a set of Quick-Set today from your dealer. But be sure you obtain genuine Quick-Set reamers—made only by



fast-



BEHIND King Quality Piston Pins stands a plant and equipment designed for the manufacture of extremely accurate parts on a quantity basis; skilled operators, long experienced in the making of piston pins; the most rigid inspection after every stage in production and a genuine realization on the part of every worker that upon his shoulders rests the responsibility for the maintenance of the standard.



It is not worth while to use less than the best.

Automotive Division

KING SEWING MACHINE COMPANY
Buffalo, N. Y. Bridgeburg, Ont., Can.



There's no profit for you in a measuring stick



YOUR profit is in the GAS GAUGE—and every Ford owner is a prospect.

The Tasco Gasoline Gauge is threaded.
Unscrew the tank filler cap—throw it away—screw the Tasco Gauge in its place—and leave it there.

How's the gas? Lift the seat cushion and look! Better than a measuring stick? No comparison. Sell fast? Every Ford owner needs one and wants one.

The price is only \$1.25 but the value is practically indefinite. Tasco will wear for years.

There's a Tasco Gasoline Gauge for every type of Ford car—and there's a liberal margin of profit for the dealer. Tasco is a "real demand for" necessity.

Today is the time. Write now.

THE AKRON SELLE CO.

AKRON, OHIO



For the NEW Ford

When your Ford is new, it is absolutely essential that the motor be supplied with an uninterrupted and sufficient amount of oil. Install a Ford Faithful Oiling System the first thing. It will assure that necessary lubrication that means the very life of your power plant. It will mean the prolonging of the life of your motor 50% and will generally increase its efficiency. No need to worry about burnt-out bearings or other motor trouble—and the continuous lubrication supplied the transmission bands by the Ford Faithful will render the necessity of adjusting or relining bands a rare occurrence. RIGHT NOW—before you have experienced the expense of a clogged oil line—before you have scored your cylinders and your motor has developed "oil pumping"—put on a Ford Faithful Oiling System.

Ford Faithful Oiling System

\$5.75

DEALERS Are you stocking Ford Faithful Oilers? If not, get in touch with the factory RIGHT NOW and find out how extremely advantageous it is to handle this fast selling and necessary article.

The Ford Faithful Oiling System is sold on a money back guarantee. It will make satisfied customers who will return to your place to supply all their motoring needs. Cash in on Ford Faithful advertising and good will. Every Ford Owner is a live prospect, so why not get this business in your territory?

Write for special dealer proposition and descriptive folder.

W. O. Thompson Mfg. Co.

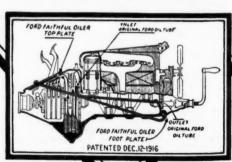
330 Mountain View St.

PASADENA

CALIFORNIA

Ford Faithful patents are being upheld. Infringers will be prosecuted to the full extent of the law.

FORD FAITHFUL



Meilicke RAMSPRING BUMPERS Signals



Back-Stop

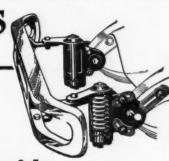
with Tail Light

This Meilicke Signal serves three purposes, and is profitable in proportion. It combines the tail light, the lucky horseshoe stop light and a powerful white backing light in one tidy unit. Of course it has a Check-Lite to tell if a faulty wire has put the stop signal out of business; and the trouble-proof Meilicke switch is a part of it.

The whole thing sells for less than the three articles separately, so customers are easy to find. You get as much or more out of it than you would by selling the three articles, so everybody's happy.

Ask your jobber for a stock of Meilicke Signals. There's one for every need, so you won't have to stock a lot of lines. Send the order at once.

MEILICKE CALCULATOR CO., 44 WRIGHTWOOD AVE. HICAGO ILLINOIS CHICAGO



Successful and should be

The acceptance and popularity of the Ramspring Bumper is remark-

And Ramspring's successful record is surely deserved, for no other bumper ever offered so much to a car in beauty and protection.

Just show Ramspring and at a glance your customer will appreciate its beauty and realize its strength and powerful resistance to shock.

The Ramspring double steel cross bar is built for the hardest kind of service and the Ramspring encased coil shock absorbers directly behind the cross bar absorb the full force of any blow from a mere bump to a terrific crash-and whether head-on or at an angle.

Ramsprings are furnished in sizes to conform to individual weight and size specifications of various cars.

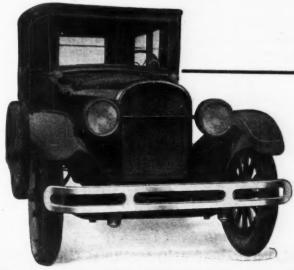
Ramspring is the bumper you can be proud to sell—Better than that— Ramspring sells easily and without argument.

Build your profits with Ramspring quick sales.

There's a liberal dealer discount from the list.

Ramspring Bumper Company

624 West Adams Street Chicago



The Coils Cushion the Crash



Better Profits Finer Work Quicker Service

That's what the Colonial Cylinder Hone offers to every garage and service station.

It is the new and modern method that nearly all automobile manufacturers have adopted for sizing cylinders and enables you to do re-sizing for fitting oversize pistons in the same efficient manner.

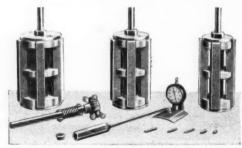
Any mechanic's helper in five to twenty minutes per cylinder can do a better job with a Colonial Cylinder Hone than the best expert can do by any of the older methods, and he doesn't need to remove the block from the car.

Colonial Cylinder Hones

Are self-centering and self-aligning. They make the bore perfectly round, the walls absolutely straight and exactly parallel and polish the surface so highly that they need no "running in".

Illustration below shows a complete Colonial Cylinder Hone Set with Colonial-Ames Micrometer Dial Cylinder Gauge having capacity for honing all cylinders from 234 to 434 inch bores.

Also furnished in individual sets for small—medium and large bore motors. All sets packed in substantial metal cases.



SEND FOR ILLUSTRATED CIRCULAR AND FREE TRIAL OFFER

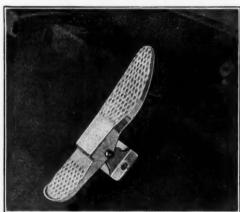
COLONIAL GEAR AND MANUFACTURING CO.
KALAMAZOO, MICHIGAN

THE EN

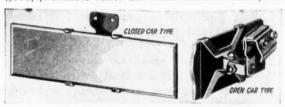
Is a Selling Line

There is a demand for every item, and every item is made to satisfy that demand at a popular price. The discounts allow both jobber and dealer to get a good profit, while the demand assures getting that profit quickly. Look over the articles below, and see for yourself the salability of the GREEN Line.

Green Manufacturing Co.
506 Second St., Milwaukee, Wis.



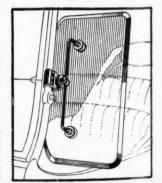
SELL this Cramp-Killer

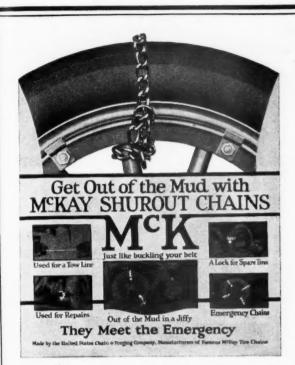


And this Rear View Mirror

Beveled Belgian plate glass, in three sizes, 25%x7. 3x8, 3x10. Brackets for both open and closed cars with 8" and 10". Fittings black or nickel. New friction universal joint holds mirror at any angle showing road behind without turning around. Not

a rattle in a carload. Sell it and profit at \$1.60 to \$2.50 list.





Put this Display to Work

There are five important uses for McKay Shurout Chains—and here's a display that tells the story of all of them, shows an actual chain as used, and-put on your counter or in your window-will sell these chains for you. It is sent, free, to every Shurout dealer.

McKay Shurout Chains are emergency chains that can be applied in a moment, without tools. They'll provide traction to get a car or truck out of the worst kind of mud or sand. Shurouts are also allaround utility chains, and their many uses make them easy to sell.

Tow-line—The special buckle on each chain makes it possible to fasten a set of Shurouts together and use them as a tow-line.

Spare-tire—A single Shur-out chain, wound around a spare tire and tire-rack or spring, and secured with a padlock, makes an effective safeguard for spare tires.

Broken spring—A broken spring can be held in place until permanently repaired by wrapping and buckling a Shurout chain around the broken part.

Emergency tire chains— Especially for trucks, Shurout chains make effective emergency chains on wet or icy roadways.

Someone in your territory is going to cash in on the unlimited sales possibilities of McKay Shurouts. Why not you? Send your order to your regular jobber, or write us today for the names of McKay jobbers.

UNITED STATES CHAIN & FORGING COMPANY
Union Arcade, Pittsburgh, Pa.

Makers of McKay Tire Chains and a Complete Line of
Chains for All Commercial and Industrial Purposes

Plants at York and McKee's Rocks, Pa.; Columbus and Marietta, Ohio; Huntington, W. Va.

MCKAY SHUROUT CHAINS



Show them how to get more power from their Fords

The Krafve Mixer Intake Manifold will appeal to Ford car and truck owners because it means getting added flexibility and power from their machines.

The Krafve Mixer Manifold vaporizes the gasoline and mixes it thoroughly with air as it passes to the cylinders -making the mixture more powerful and efficient.

Once installed, because of its simple construction, it cannot get out of order.

Some advantages from the use of Krafve Manifold are to:

- 1. Start motor readily in any kind of weather.
- 2. Make motor run smooth in any speed.
- 3. Throttle down very low on direct drive.
- 4. Keep gasoline out of crankcase.
- 5. Give motor greater flexibility and power;
- faster pick-up and staying ability on long continued fast driving without over-heating greater speed and hill climbing ability.
- 6. Get more mileage from gas and oil.
- 7. Eliminate hot spot or other mechanical de-

The retail price of \$5.00 makes every Ford owner a prospect.

Dealers and Jobbers: Get our attractive proposition.

KRAFVE AUTOMOTIVE CORP. Worcester, Mass.

Corner Brackett Ct. and Shrewsbury St.

MIXER INTAKE MANIFOLD For Ford Cars and Trucks



Simply send us your name if you sell or use Never-Leak Gaskets

WE want every dealer and garageman, handling or using Never-Leak BOUND EDGE Gaskets, to take advantage of the new service we have arranged for his special benefit.

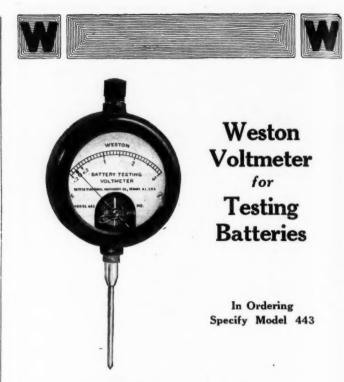
If you sell Never-Leak, your name should be included on the list for this free service—so don't fail to get it in to us at once, together with your business address.

Each month you will receive new salesgathering material—data that can be counted on to increase your monthly gasket sales, and boost your profits in proportion.

For your trouble in sending us your name and address, thereby helping us compile a roster of Never-Leak dealers, we will mail you one of our cylinder head gaskets NO CHARGE—any style or type you choose.

THE FITZGERALD MFG. CO. Torrington, Conn.

NEVER-LEAK
Cylinder Head Gaskets



Correct Battery Voltages

Weston Battery Testing Voltmeter is a thoroughly dependable instrument calibrated to take exact measurements of the E. M. F. of individual cells. The range is 0.2-0-3 volts. This Voltmeter also makes accurate Cadmium Tests possible. Compact—durable—easily handled—acid proof Bakelite case. This convenient instrument is essential to every garage and service station for making quick tests.

Without Weston testing instruments, you cannot render the highest standard of service to car owners. Write today for complete information regarding these various important instruments.

Weston Electrical Instrument Co. 10 Weston Avenue Newark, N. J.



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Three Winners!

The Cincinnate

PORTABLE ELECTRIC HAND DRILL

1/4" Capacity—Universal Motor Weight 4 lbs.

PRICE 4

Pistol Grip with Automatic Switch. "Stream" Line design for Close Corner Work. All-aluminum motor frame. Simple in construction. Air cooled.

> 1" "SPECIAL" DRILL Universal Motor-Ball Bearing



Light weight. Particularly adapted for garages, service stations and general utility work.

COMBINATION BENCH DRILLING STAND FOR USE WITH THIS DRILL

PRICE \$24

1/2" HEAVY DUTY DRILL SINGLE AND TWO SPEED

Universal Motor—Ball Bearing

PRICE \$Q TWO SPEED SPEED

Powerful, durable, compact. A thoroughly practical heavy duty hand or breast drill for production work. Guaranteed in every

GRINDERS

Bench-Floor-Tool Post-Aerial TIRE ROUGHING AND BUFFING LATHES

Send for Catalog

THE CINCINNATI ELECTRICAL TOOL COMPANY

1515 Freeman Ave.

Cincinnati, Ohio

NEW YORK

SAN FRANCISCO

SEATTLE

PHILADELPHIA
1320 Real Estate Trust
Bidg. LOS ANGELES 510 Equitable Bldg

GOOD MEDICINE

PRESCRIBE IT for the fellow who's had trouble with the other kinds

ARROW GRIP JACK

Handle Controlled



He'll appreciate the relief of its comfortable operation from a standing position. He'll be gratified at the few easy turns of the handle with which it raises the load. He'll welcome its cleanliness for the sake of his hands and clothes. And if

he's ever had his car come down with a jolt, he'll be won by its dependable worm and nut mechanism, free from springs and pawls.

Three sizes to fit all cars and trucks.

ARROW GRIP CHAINS

For Pneumatic Tires

With the handy Arrow Grip Cross Chain Fasteners.

An Arrow Grip necessity designed for simplicity, security, econ-



omy and ease of operation. Permits cross chain replacements without removing chain from the tire. Permanent replacements made on the road—quick. A turn of the button releases the broken chain,-another turn fastens the new one securely. Short length of chain only need for replacements.

Fasteners are also sold separately for use with other chains.

> Prescribe Arrow Grip equipment. You'll win your customer's good will and a nice profit besides.

Ask Your Jobber or Write for Literature

ARROW GRIP MFG. CO., Inc.

GLENS FALLS, N. Y.

Export Office: 280 Broadway, N. Y.



HICH SPEED HOISTING & CONVEYING OUTFIT

> For the Manager who wants TONNAGE and the Mechanic who wants Convenience

> > Save Money by Efficient Hoisting

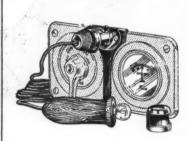
We have just the outfit you need and it's within your means.

1 ten ton high speed hoist-1 piece 15 foot rail -necessary brackets.

All ready to put up-\$95.00 We have the same thing except it's a 5 ton hoist for \$75.00

Send your order today. It's the Best Hoist Made.





What's Wanted—SELLS **CLAMP-ON**

Is Wanted

It's Like the Ford—A Good Buy

The Automobile Public now realizes the value of the Clamp-On Dash and Trouble Light. The proof of this is our sales, which are increasing daily.

How and Why?

- something that can be used after they buy it.

 EASE OF INSTALLATION means it does not take a genius to attach, nor is it necessary to mutilate the car by BORING HOLES.
- Because there are four essentials that make up a motor car necessity which are: UTILITY—EASE OF INSTALLATION—QUALITY AND PRICE, and they are incorporated in the CLAMP-ON.

 1 UTILITY means that car owners have something that can be used after they buy it.
 2 EASE OF INSTALLATION means it does not take a genius to attach, nor is it necessary to mutilate the car by BORING HOLES.

 3 QUALITY means the best mankind and nature can produce.
 4 PRICE means value received and aside from this your profits are larger when you sell Clamp-On than you would reasonably expect to receive on a \$2.50 sale.

Your Profits Almost Equal Your Investment

THE BOYD CORPORATION

2822 Locust St., Station A, Checker Bldg., St. Louis, Mo.

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Philadelphia J. V. Kane & Co. 3137 N. Broad St. Cleveland, Ohio T. F. Dolan 3050 Kensington Rd. New York Forshay Bros 234 W. 55th Dalias, Texas Tom M. Lamberth, Box No. 807

St. Louis, Mo. Holliday-Fitzgerald Sales Co. 2822 Locust St.

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New York City, home-office Guiterman-Rosenfeld & Co., 35 S. Williams St.

Sales Agencies. Appointed by Guiterman-Rosenfeld & Co.—Great Britain, Irish Free State, Australia, Norway, Sweden, Belgium, New Zealand, Denmark, Holland, Italy, France.

in

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Huetter's Fly-Wheel GearBands cost less in the long run

Of course, you can buy fly-wheel gear bands for a little less. But the farsighted, wide-awake dealer knows that to build up a business with every customer a booster, he must look to the quality of the gear as well as the price.

Huetter's Fly-Wheel GearBands

-quality all the way through

"Huetter Gears Are Better Gears."
They are made of hard, tough steel, and electric welded. They are chamfered to specifications recommended by the Manufacturer of the Eclipse Bendix Drive. Naturally, identical pointing is as necessary to correct meshing as identical pitch.

Huetter's Fly-Wheel GearBands

are delivered in a hurry

At Huetter's, shipments get under way within the hour. Central location and better shipping facilities assure quicker service to Distributors. Rush orders are sent to you parcel post special delivery by these Distributors located at points of advantage throughout the country.

Order Direct

Write NOW for Our New Catalog List!

HUETTER MACHINE & TOOL CO.

545 Kentucky Avenue INDIANAPOLIS

"When and Where you want it"

-writes brother Kneisley. Read what he says:

"We are in receipt of your sample of Kester Acid-Core Wire Solder and wish to say we find it much superior to other solder in the repairing of leaky automobile radiators, as you have the solder and the acid where you want it, when you want it."

Exactly what we've said, time and again, and will gladly prove it. Write us for a sample.



Sold by live dealers everywhere in one pound coils, in cartons, and on one, five and ten pound spools

Manufacturers

CHICAGO SOLDER COMPANY

4203 Wrightwood Avenue, Chicago

Direct Factory Representatives: THE FAUCETTE HUSTON CO. Chattanooga, Tenn.

LOUIS J. ZIESEL CO. 216 Market St. San Francisco, Cal. RICHARD F. ELY 66 W. Broadway New York City

KESTER

Acid Gre WIRE SOLDER



Requires Only Heat

Packed In 100 ft. Lengths-







No matter how often filed off or dressed down a Smith Tip never changes. The hole is bored, not cast, and is of exactly the same diameter throughout. The size of the flame is therefore always the same.

There is no explosion chamber in a Smith Welding Tip. A Smith Tip does not splatter hot metal on the welder. The mixing chamber extends from mixing nozzle to tip, eliminating gas pockets, popping and back fring

back firing.

Only pure, heavy all-copper bars (not composition) are bored to make Smith Tips. That is why they cool best and last longest.

Send for our booklet: "The Latest Word in Torches."

Exclusive
Manufacturers of
Welding and Cutting
Equipment

SMITH'S INVENTIONS INCORPORATED

> Dept. A Minneapolis

The Little Watchman for Fords

THREE FORD NECESSITIES COMBINED IN ONE FAST SELLING PRODUCT

The Little Watchman for Fords fills a long felt need for a gasoline reserve, a gasoline gauge, and a thief-proof gasoline lock.

Here is a product that gives threefold protection. It guards against running out of gas, by providing a reserve gallon of fuel. The accurate gauge shows the Ford owner the exact amount of gas he is receiving from the filling station, and the approved tumbler lock protects the car against theft.

Mounted on kick board above the floor board. Installation is very simple. Price, complete, \$5.00.

Jobbers and dealers, write for discounts and full details

Autoquip Mfg Co. Inc.

Rochester, N. Y.



The Ball-Bearing That Will Build a Reputation for You

UILD a reputation for your business by giving your customer the benefit of the best on the market.

The world over, automotive experts recognize R.I.V. ball-bearings as the best. They are not "good enough"-THEY ARE THE BEST.

Their accuracy, their finish, their friction-reducing quality, which you can test and prove by rolling an R.I.V. ball-bearing on your fingers, are a joy to the repair man who takes delight in doing a good job.

R.I.V. ball-bearings are not high-priced—they cost no more than the common kind.

You can get them as quickly as though the factory were in the next town. A big stock kept in New York and in our widely distributed service stations insures prompt execution of all orders.

Use R.I.V. Ball-Bearings on your next repair job.



BATTERY PLATES will wear out



OUR 90-DAY PLAN

Our 90-day plan enables you to buy plates as you

need them at quantity

prices without loading your shelves with stock.

Ask about it.

But a lot depends on how long it will take them to wear out. If they do not outlast your guarantee, you have to replace them. You can't charge your customer. You pay the billfrom your original profit on the job.

Make Your Guarantee Stand Up

GENERAL plates will run long past your guarantee. When they give up their final bit of current, your customer has obtained what he wants most from his battery—dependability. When he comes back, it will be to spend more money—not to kick.

> Our folder "A Shop Talk on Battery Plates" gives some interesting tests that may be new to you. It is yours for the asking.

General Storage Battery Co.

2005 Locust Street. St. Louis, Mo.





AMASTERPIECE of mechanical perfection -reinforced at every vital point-built to serve long and well.

MALCO Universal Windshield Cleaner

Clamps on windshield frame at any point, or bolts thru hole drilled for that purpose—any kind of car. The only cleaner you'll need in stock—the only kind you'll be satisfied with.

PRICE \$1.50

Ask your jobber's salesman about the Malco products or write us direct, sending name of jobber.

Malco Products Corporation 220-224 West South Temple, Salt Lake City, Utah



Locks the Intake-



The Sure-Lock locks the motor or power plant of the car—operating between the carburetor and the manifold. When locked—a shutter cuts off all mixture supply with the result that the car

a shutter cuts off all mixture supply with the result that the car cannot run.

When unlocked it does not affect the ignition, gas or transmission in any way, and once installed it becomes practically a part of the car.

It cannot be removed and therefore balks the thief. Further—there are no two keys alike and no master key.

The Sure-Lock is rugged in construction—solid—and will last a life-time. It is just as good for Trucks as for Passenger cars. In addition it has an automatic air valve which cuts down gas consumption and affords a big saving. A record of 32 miles on one gallon of gasoline.

consumption and another a big saving, one gallon of gasoline. Salesmen will find this an exceptionally fine side line. Dealers have an open market—the field is wide open for a lock that the thief cannot pick or manipulate. Dealers and Jobbers—write today—now—for full particulars and discounts.

THE SURE-LOCK MFG. CO.

107 St. John St.

New Haven, Conn.

No Matter How Tight-



No matter how tight a wheel is on, this pulling tool will start it loose. We are wheel-puller specialists, and for years have supplied pulling tools that do the work. Arms dropforged from high carbon steel, screw casehardened with inserted tool steel

Three models, 4 sizes of each, all equipped with Locking Arms of latest design.

Our 24-page folder is an eye-opener. Write for it.

Crane puller co.

SEMI-STEEL REPLACEMENT PISTONS DALL



For replacement work after a rebore or re-grind job insures your customer as good if not a better job than the original assembly.

Dall Pistons are simply GOOD Pistons, made to manufacturer's specifications, sometimes more refined in design and lighter in weight, but always as carefully made and inspected as though they had to pass the most rigid inspection of a Motor Manufacturer.

Dall Pistons are regularly furnished in standard and various oversizes, also semi-finished 1/16 oversize.

Write today for price list and delivery schedule on all items. Dis-tributors at various points will take care of your requirements.

THE DALL MOTOR PARTS COMPANY

Post Office Station D, Cleveland, Ohio Southwestern Branch THE CARROLL CO.

2218 S. Harwood St., Dallas, Texas



The National Automobile Shows Wonder Sensation

UNIVERSAL AUTOMATIC **SPRING OILER**

Discovered and invented by Grus

Astounding and Unbelievable results

GIVES PERMANENT RELIEF FROM SPRING **SQUEAKS** OILER ATTACHED



The Perfect Leaf Spring Lubricating System

Retail Price Regular Sizes 75c each

Complete Set of Four for FORDS \$2.50 per set

MANUFACTURED UNDER GRUS BASIC PATENTS

Just think of it, no more broken springs; no more rusted springs; no more squeaky springs; no more inactive springs; no more wasted

oil.

THE UNIVERSAL AUTOMATIC SPRING OILERS make your car run smoothly, easily, quietly, comfortably, begin immediately to lay a thin film of oil between the spring leaves. Just slip the oilers over the spring directly back of the spring clip and they are there to stay—will outlast the car.

Sold at

Accessory Stores, Garages, Department and Hardware Stores.

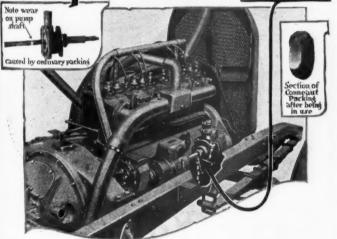
If your dealer does not handle them, order direct. It takes two oilers for each half spring—one for each quarter spring.

A Few State Distributors Wanted-Write Quick

The Universal Spring Oiler Company

Dept. E Medinah Bldg., Chicago, Ill. "SEVEN FACTORIES"

That Leak



Most every repair job calls your attention to a leaky pump. The old way to try and fix it was with a piece of string—or some form of packing material that gave temporary relief—but did not prevent leakage and wear on the shaft as the packing nut was tightened.

the shaft as the packing nut was tightened.

Now—a metal packing—plastic in form—that you mold quickly with the fingers to fit a stuffing box of any size—seals the pump shaft TIGHT and forms a smooth, metal bearing—which is adjustable and practically frictionless. Result — no more leaky water

pumps-no more kicks from customers. Just all-around satisfac-

"Conneaut" Plastic Metallic Packing is a semi-metal composition, compounded by a special
process that produces a noncorrosive, practically frictionless
bearing against shafts and is particularly adapted to automobile
water pumps.
Service and Garage Managers—
"Conneaut" does the trick. Get
it from your Jobber today. Try
it once and you'll always want it.
Don't forget—order today. Your
Jobber has it. 'Conneaut" Plastic Metallic

Jobber has it.

The CONNEAUT PACKING COMPANY, Conneaut, Ohio PLASTIC METALLIC
PUMP PACKING

Safety First! Clean Both Sides of Glass

Car owners like Jiffy Windshield Cleaners because with one sweep across they can clean and dry BOTH sides of the glass.

This insures a clear view of the road in all weathers—in all emergencies.

The Jiffy is attractive, sturdy and efficient — positively will not rattle. Easily installed.

Dealers like to handle the Jiffy because it is becoming more and more popular with motorists—and quick sales are

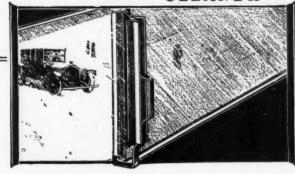
DEALERS: Send for attractive counter and window display, descriptive and illustrative data. Also the discounts.

THE LA VIETES MFG. CO., Inc. New Haven, Conn.



Sells Itself on Sight

WINDSHIELD CLEANER



Features & Construction No. 8

Low, Compact Design Permits Moving to Any Part of the Shop

CRANESHOIST

The Canton Portable Crane & Hoist shown below is the special garage model, designed and built to meet the individual requirements of garage service. It is compact enough to operate in close, cramped quarters, yet large and strong enough to handle the heaviest lifting

around the shop.

For convenience and years of hard, steady service, you'll find the Canton a piece of equipment without a superior.

Our catalog describes in detail this model as well as all of our other models.

Write for a free copy.

Canton Foundry & Machine Co.

Canton, Ohio York Office: 203 E. 15th St.



There is but one device made that stops oil pumping and piston slap and renews power in all types of internal combustion engines: It is the Genuine Apex Innering and is fully covered by U. S. Patents. Beware of inferior imitations. Infringements wil be vigorously prosecuted.

REBORING is unnecessary. Genuine Apex Innerings will absolutely renew the flexibility, pep and "guts" of all worn motors. Ford or Packard—truck or tractor—motor boat or farm light plant or stationary engine—results are the same: Renewed silence, power, economy, long life.

Iong IIIe.

Have your dealer or repairman install a set today. Retail Price, 30c each up to %" wide or 5" dia. Larger 50c. Order like piston rings.

DEALERS: Order from your jobber. Capitalize on quick installation jobs and added resale values.

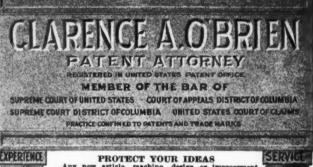
JOBBERS: A quick-turning line. Get facts today and list of present jobber connections.

THOMSON-FRIEDLOB MFG. CO.

Dept. C

Illinois





PROTECT YOUR IDEAS

Any new article, machine, design or improvement thereof, or any new combination of parts or improvements in any known article which increases its efficiency or usefulness, may be patented if it involves invention.

IF YOU HAVE ANY NEW IDEAS

which you feel are useful, practical and novel, take prompt action toward protecting your rights. If you have invention, any own machine, or new combination of parts or improvements, or new process or design. SEND DRAWING, MODEL OR DESCRIPTION of it for information as to procedure to secure protection. WRITE TODAY FOR BLANK FORM "EVIDENCE OF CONCEPTION"

to be returned to me with drawing, description or model of your idea. Promptly upon receipt by me of your idea I will write you fully as to procedure and costs.

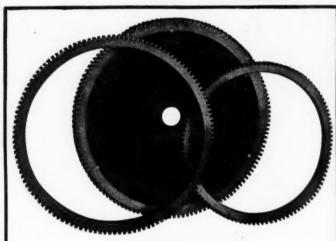
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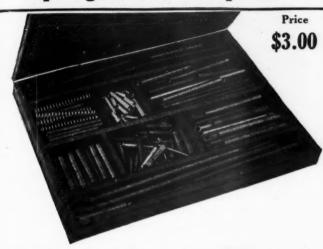


Save Your Fly Wheels

When a tooth breaks in your starter gear why buy a new fly wheel. Simply turn off the gear teeth and fit on a Meachem Steel Ring Gear. It is much cheaper and will outlast the car. thousand in stock.

> THE MEACHEM GEAR CORP'N. Syracuse, N. Y.

Springs For All Purposes



Peck's Assortment of coil springs contains about every-thing needed in the busy Garage, Service Station and Re-pair Shop in the shape of

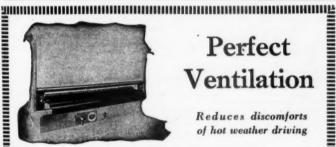
pair Shop in the snape of springs.
It is also a ready seller over the Accessory counter. The car owner finds it to be just what he wants and needs.
Always ready—no stopping to

make—no waiting — just reach into the box and pick out what you want. Peck's Assortment of Coil Springs comes to you in a well built wooden box, partitioned off into convenient spaces. Handy, efficient, good. Order your box today. Jobbers—write us for prices and discounts.

THE PECK SPRING CO.

PLAINVILLE

CONN.



Perfect Ventilation

Reduces discomforts of hot weather driving

Ford windshield frame.

Adjusted in an instant
 —no screws to make tight or loose.

6. Can be locked in any position and does not rattle.

The Phillips "Keep Kool" Ventilator is newsomething to make the driver more comfortable and keep him in a happy mood. Ford owners will be glad to know about it. Show it to them.

7 REAL ADVANTAGES

- 1. Gives more ventilation than a tilted windshield or any other ventilator on the market.
- Directs cool air on the feet of the driver.
 Absolutely rain tight when closed protects the coil box.
- 4. Made to fit standard
- 7. Adds to appearance of the car and very easily installed. Jobbers and Dealers. This is a thoroughly tested article—guaranteed. Sells readily and at a good profit. Distributors Wanted! Write for your territory new!

F. C. PHILLIPS CO., Stoughton, Mass. Manufacturers Screw Machine Products.



A Necessity

HARRIS OILS GREASES

In a class by themselves

Lubrication is without question one of the most vital factors in automobile maintenance. One sure way to gain the good will and confidence of your customers is to advise them to use Harris Oils. After they have used Harris Oils a short while, they will wonder why you didn't tell them sooner. For when it comes to a question of perfect lubrication, Harris Oils are in a class by themselves.



"America's Leading Lubricants"

Copyright AWHOCO 1921

A. W. Harris Oil Co.

Previdence, R. I.

Chicago, Ill.

Dealers-Write for sales plan.

Stock the L

HERE'S the only gauge that is 100% efficient 24 hours a day. A finger-touch tells—on darkest night—amount of gas in tank. Well built. Richly finished. Absolutely dependable. Instantly

installed. Show it—and sell it!

Read it with your eyes in the davtime.

Read it with your finger-tips at night.

Jobbers and Dealers: Write for samples-prices-discounts. The Lee outsells all other gauges five to one!

Now made for:

Chevrolet, All Models. Overland, All Models. Ford, Sedan.

Ford, Regular, (\$1.50)

The Columbus Company Desk 6 314 E. Broad St., Columbus, O Retails at \$2.00 Ford.

Regular \$1.50



Just Clear the Cylinder

No skilled help is required to resize cylinders with the Auto-Hone — it is so simple and effective.

It ordinarily takes about four days to com-pletely dismantle a motor—send the bloc out for cylinder resizing — get it back and reas-semble the engine.

The modern way is—connect the flexible arm of the Auto-Hone to your electric drill—slip the Auto-Hone into the cylinder—turn on the power—and in fifteen to twenty minutes the four honing stones remove the usual five to seven thousandths out-of-round—all traces of taper — ring travel — unevenness — leaving a clean, smooth, polished cylinder surface.

Every Garage and Service Station can make a big profit.

Put aside questions—disputes—curiosity—and get the facts. Order yours—today.





SOLID Underportion

One of Seven Superior Parker Features

The Underportion, where most vises are cast hollow, is cast solid in the Parker, giving strength where strength is needed. This construction is made possible by having the saddle and saddle screw on the outside, which permits the taking up of lost motion and the easy removal of screw for lubrication.



Send for Parker Feature Folder No. 9.

The Charles Parker Company Master Vise Makers

Meriden, Conn., U. S. A.



extolite

A General Electric Product and will end timing gear train noises forever.

JOHN C. HOOF & COMPANY

157 W. ILLINOIS ST.

CHICAGO, ILL.

Sole Distributor to the Service Trade

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Of MOTOR AGE	Act of Congress of August 24, 1912 published Every Thur	rada
at	for Aprilfor April	.192
COUNTY OF	Cook SS.	
Before me, aNotary	Public in and for the State and County afore. E. E. Haight who, having been duly s	said wor
according to law, deposes and	says that he is the Manager	0
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\$1500 Profit in Three Months' Selling



One man did it and he is only one of the many dealers and agents who are cleaning up big profits with the Optoshield. Men who have spent years in the business report to us that the Optoshield is the most popular and easiest selling accessory they have ever handled.

Big Money For Agents and Dealers

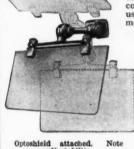
We are now appointing territorial distributors, dealers, local agents and representatives traveling in their own cars. If you are looking for one of the livest items that have been brought out in years, get in touch with us. Discounts are unusually liberal.

in touch with us. Discounts are unusually liberal.

The Optoshield relieves the driver's eyes of all strain from oncoming headlights, sun glare, road glare and snow glare. Made of beautiful sapphire blue Belgian optical glass. Fastens instantly to any windshield. Price complete is only \$3.50. Get in touch with us at once and learn the details of this meanwanting proposition. money-making proposition.

> Detro Sales Service Co. 1647 Penobscot Bldg. Detroit



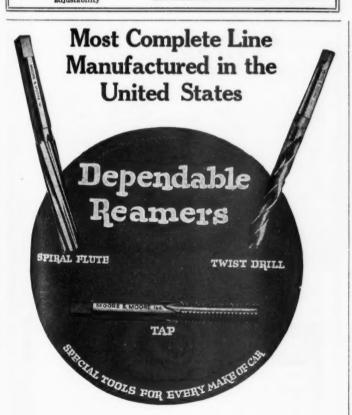


Optoshield attached. adjustability

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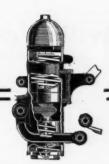
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End life.:
orge fork leot,
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Moore & Moore, Inc.

Reading, Pa.



A Real Absorber

one which is easily and quickly installed and functions perfectly when installed.

No cutting of frame-no leaking-no trouble-just one constant moment of smooth riding without the usual trouble

Let us tell you about it.





Instant Soldering

TORIT Acetylene Torch No. 13

Ready to Use the Second You Light It

This is a wonderful torch for all kinds of soldering, brazing, preheating, babbitting, radiator repairing, splicing wires, etc. It is a time saver and enables you to quickly do a range of work that a soldering copper alone cannot do. Garages cannot afford to be without the Torit Outfit No. 13.

Uses Acetylene Only

Order from your jobber or

St. Paul Welding & Manufacturing Co.

169 W. Third St.

The Melville Foot Rest

Insures Driving Comfort A foe to fatigue.

The weight of the foot drives the car.

No muscular or nervous tension.

Eliminates accidental acceleration.

Bumps and boulevards are all alike with this foot rest.

The even flow of gas makes for driving economy.

Depressed to any running speed, the friction is great enough to steady and rest the relaxed foot, allowing the weight of the foot to drive the car.

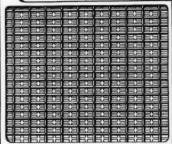
Made of polished aluminum.

The Melville Machine Co.

ellevue Ave.,

Detroit, Mich. Any Car in a Few Minutes \$3.75 Marketed FRICTION HINGE Write for Discounts Detroit, Mich.

Cramer Reinforced Plates for Battery Makers



These reinforced plates constructed sufficient brace to withstand the most severe strain.

The active material is locked into the plates—preventing buckling or splitting.

Cramer Reinforced Plates are specially built for hard service.

Send for full particulars.

CRAMER BATTERY COMPANY

515-17 Wyoming Ave.

Scranton, Pa.



We offer the services of our Engineers in assisting Designers on layouts involving the use of Thrust Ball Bearings in any type of machine where Thrust Ball Bearings can be used. Our broad experi-ence covers many years. We are ready to serve you at any time.

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LANCASTER, PA.

Western Sales Office,

1012 Ford Bldg., Detroit, Mich.



EXPANSION HAND REAMER

DIFFERENT ANGLES Each successive blade cuts AT A DIFFER-ENT ANGLE

from the one

before it.

even in keyed holes. TWICE the expansion of others. All sizes. Money-back guarantee.

Ask about the GAMMONS TAPER PIN REAMER-Wonderful Time-saver.

THE GAMMONS-HOLMAN CO.

Manchester, Conn.

No CHATTER,

no DIGGING IN-

Are You Making Money?

If you aren't making enough out of the battery business, that is all the more reason why you should handle the Dragon. Dragon dealers are building up a great reputation for themselves and making real money at the same time.

Write and let us state our proposition. Englert Manufacturing Co.

Pittsburgh, Pa.

Just What the Trade Wants-A HAT RACK for any Car

Here is an article on which there is bound to be a quick turnover. It is an accessory which car owners have long wanted but could never find.



A Price Which Makes

A Price which make 'Em Buy
An insignificant price, especially considering its apparent utility.

SAND'S AUTOMOBILE HAT RACK

Fastens to the top where it holds and protects the hat, completely out of the way. Saves hat cleaning bills. Enclose \$1.00 for sample.

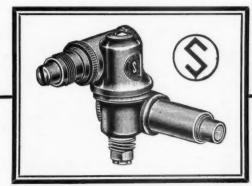
Dealers! Get our proposition

Racine Iron & Wire Works

Racine, Wis.







8 Big Reasons Why CIRCLE "S" SWIVEL JOINT Sells Itself

- 1. Correct Design
- 2. Accurately made parts
- Self-Aligning center bearing — practically wear proof
- 4. Felt gaskets seal inside 8. It is a Circle "S" against water

Get Full Details and Prices by writing

F. W. STEWART MFG. CORP.

349 W. Austin Ave.

Chicago, Illinois

5. Bearing fitted shafts that cannot slip

6. Easily changed from right to left

7. Parts Interchangeable

Manufacturers of the well known Circle "S" Automatic Windshield Cleaner

PONTIAC

Windshield--Top--Support for Ford Touring Cars

Stops the Stretch and Saves the Top



Holds the Ford top down to the windshield firmly and neatly, in a manner similar to that used on practically all other cars.

Eliminates the destructive strap strain which quickly stretches the top fabric and causes it to sag. Rattling is prevented. Swaying is greatly reduced. No chance for top to come loose on road and cause accident. Supports are drop forged from S. A. E. standard steel—black enameled with nickel plated screws. plated screws.

The great demand coupled with the low price makes this proposition a real money maker for dealers. Discounts are liberal. Send in your order and start pocketing the easy profits.

Single Shipments by mail, postpaid

American Forging & Socket Co.

\$ 1 75 Pair



Complete \$1.80

Extra Brass-lets: 90 cents lets: 90 coper box per 1,000.

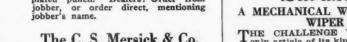
The No. 230 Elm City Terminal Outfit

—eliminates the tedious, old fashioned method of soldering on terminals for wiring jobs; and losing ten minutes' time with each operation.

It is simply a case of removing the insulation from the wire ends, splitting the cable, twisting the wire around brasslet—and operating punch. The entire job is done in less than one

Send for a stock of Elm City Terminal Outfits. Each outfit consists of 1000 brasslets, and an eight inch nickel-plated punch. Dealers: Order from jobber, or order direct, mentioning jobber's name.

The C. S. Mersick & Co. 274 State St., New Haven, Conn.



ELM CITY Window Anti-Rattlers

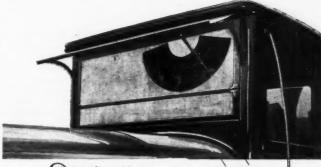
Every motorist knows how an-

Every motorist knows how annoying it is to have the windows of his car rattle excessively. And this continuous vibration in time weakens the window holdings so that damage may result.

Elm City Window Anti-Rattlers prevent this nuisance. They are strong, well made, nickel-plated, rubber tipped and will withstand any strain or vibration.

Their obvious advantages insure

Their obvious advantages insure quick sales and rapid turnover. Write for details.



Distinctive Powerful Durable

A MECHANICAL WINDSHIELD

THE CHALLENGE Wiper is the only article of its kind on the market. Operates from the fan or fan belt of any water-cooled motor or from transmission on air-cooled or electric expenses.

Positive in action, simple in opera-tion, 10 to 20 times more powerful than other types. Guaranteed to outlive any motor.

Write for full details

BERILL & COMPANY

Buffalo, N. Y. Challenge Windshield



Get This "Pioneer" Garage Special



Electric Drill and Valve Grinder

Greatest time and money saver, as well as money maker, for your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.

Louisville, Ky., U. S. A. Incorporated C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.



Most highly developed but lowest priced Air Spring. No side sway or tipping at turns.

Can be installed by dealer who sells them. Big oppor-tunity for distributors and dealers—sales are easy— discounts long. Write.

THE

REID AIR SPRING CO. New Haven Conn.



There is a Harvey Steel Disc Wheel in the various styles which we make for each size of car at interesting prices.



Rim & Wheel Co., Inc. 25 E. Jewett Ave., Buffalo, N. Y.

THE GRAND PRIX CAR

DUESENBERG

Original Straight Eight

Duesenberg Automobile & Motors Co., Inc., Indianapolis



FITS ALL CARS OPEN & CLOSED Light that Means Most to The Motorist

MFG. BY THAL & BITTER MCH. CO. TOLEDO. Q.



More Power ess Fuel

Zenith Carburetor Company, Detroit, Mich.



JACOBS CHUCKS ARE STANDARD EQUIPMENT ON THE BEST PORTA-STANDARD BLE DRILLS.

Write for circular, "A Jacobs Chuck for Every Purpose."

The Jacobs Manufacturing Co. Hartford



JOHNSON AUTOMOBILE LOCK CO. DEPT. B. ST. LOUIS, U. S. A.



THE HYDRAULIC CONTROL

More than a Shock Absorber because it fluid-cushions all morements between the body and the chassis—gives a new experience in riding comfort.

Good distribution territory is still to be allotted. For information write to

AUTO SPRING CONTROL CO. Jamestown, N. Y.



The Aristocrats of Motordom

7 Models-Open and Closed

Distributors in principal cities. Open territory now cities. Open heing closed.

Kissel Motor Car Co. Hartford, Wis.



A LITTLE SELF CONTAINED MACHINE SHOP THE FRANKLIN

Universal Valve and Cutter Grinder

The biggest little tool you can install in your shop. Requires no countershafting or pulleys. Grinds valves, reamers and cutter tools. Is equipped with a flexible shaft for reaching out-of-the-way places with a grinding wheel or wire brush, and can be hooked up for drilling. Don't spend a lot of money for expensive equipment until you have investigated this handy, efficient and reasonably priced tool. Your jobber will tell you, or write us direct.

FRANKLIN MACHINE & TOOL CO. Springfield, Mass.





EXHAUST HEATER

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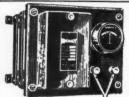
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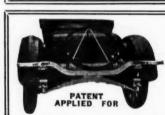
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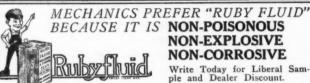
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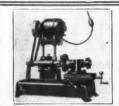
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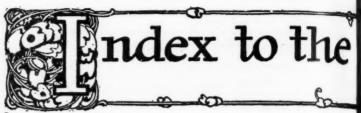
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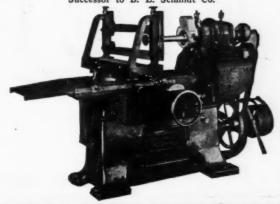
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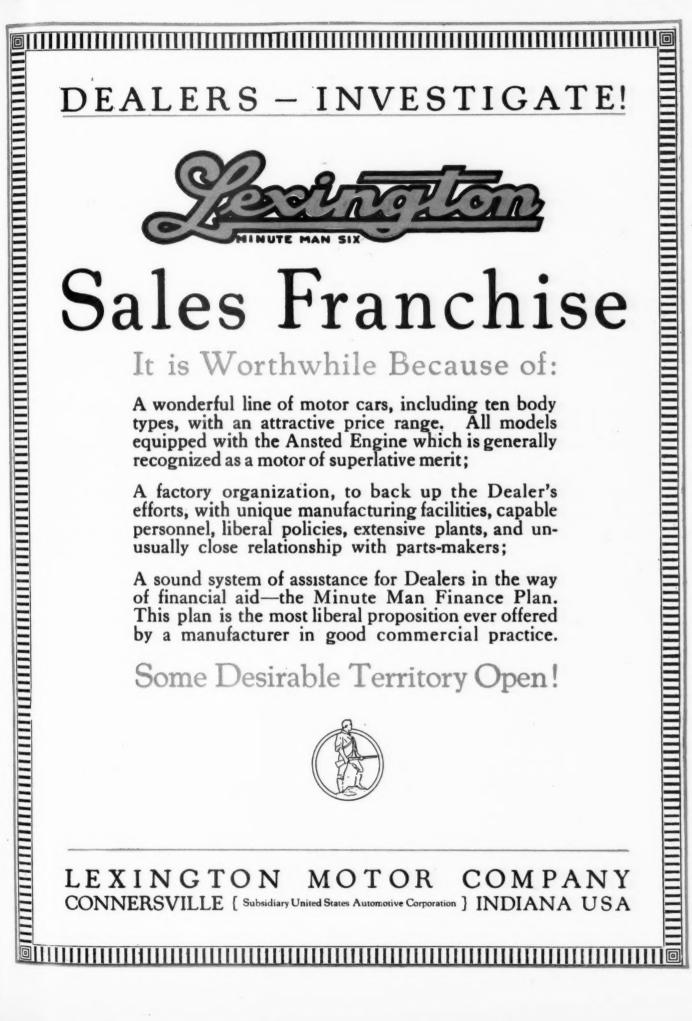
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